GENERAL REPORT

ON

PUBLIC INSTRUCTION

IN THE

NORTH WESTERN PROVINCES

OF THE

BENGAL PRESIDENCY.

FOR 1849—50.

AGRA:

PRINTED AT THE SECUNDRA ORPHAN PRESS

1850.

TABLE OF ERRATA.

Page 15, line 4, for " Principal," read " Principal's.
,, 15, ,, 17, for " enumeration," read " enunciation."
,, 20, ,, 16, for " universally," read " unusually."
,, 23, ,, 30, before " Vernacular," insert " in the."
,, 55, ,, 1, before " Secretary," insert " the."
,, 62, ,, 1, for " Four," read " Fourth,"
,, 65, ,, 23, before " that," insert " so,"
,, 67, ,, 19, for " importing" read " imparting."
,, 68, ,, 11, omit the word " all."
,, 75, ,, 13, for " for" read " as."
,, 78, ,, 1, omit " List of."
,, 84, ,, 26, for " Saugor," read " Jubbulpore."

APPENDIX.

Page xxx., line 2, for " thef rustrum," read " frustrum."
,, xxxii., ,, 7, for " 4" read " 4'."
,, xxxii., ,, 8, for " 2" read " 2'' "
,, xxxvi., ,, 14, for " W_1" read " W."
,, xxxv., ,, 38, for " $\frac{\sqrt{4W - W^2}}{2W}$" read " $\frac{\sqrt{4W^2 - W^2}}{2W}$."
,, xxxviii., ,, 2, after " x =" insert " $\pm$"
,, xxxviii., ,, 10, for " m. tan (A = x)" read " m. tan (A — x).
,, xl., ,, 16, for " $\frac{\cos a = \cos^2 b}{\text{sine}^2 b}$" read " $\frac{\cos a - \cos^2 b}{\text{sine}^2 b}$"
,, xli., ,, 6, for " 2 $\cos^2$ 2 ½ a" read " 2 $\cos^2$ ½ a"
,, xliii., ,, 20, for " point," read " points."
,, xliv., ,, 9, for " r being &c.," read " r^1 being &c."
,, liv., ,, 15, for " 3^1 and 7^1" read " 3lbs and 7lbs."
,, lvi., ,, 28, for " the nthe" read " then the."
,, lxii., ,, 31, for " 4 $\pi \times$ 80000"read " $\pi \times$ 480000."
,, lxvii., ,, 11, for " 19 x + 107," read 19 x + 10 y."
,, lxxxvi., ,, 4, for " tolerance," read " intolerance."

REPORT,

From 1st May 1849, to 30th April 1850.

GENERAL REVIEW AND OBSERVATIONS.

During the year 1849 no changes have taken place in the number or location of the Educational Establishments in the North Western Provinces.

On the 30th April 1850, the entire number of pupils on the lists of the several Colleges, exclusive of Roorkee, was 1706, of whom nearly two-thirds were Students of English. The average annual cost of the education of each pupil appears to vary very considerably, ranging from 196-0-0 at Benares, the most expensive of the Colleges, to 19-8-0 at Jubbulpore, the cheapest of the Schools.

	Students on 30th April 1850.				Studying.				*Total expenditure during the official year 1849-50.*	*Average expense incurred for each pupil.*
	Christians.	*Mussulmans*	*Hindoos.*	*Total.*	*Persian.*	*Hindee.*	*Sanscrit.*	*English.*		
Agra College, ..	11	39	337	417	144	91	31	394	39421 3 0	94 8 0
Benares ditto, ..	6	16	208	240	26	0	58	156	47092 5 0	196 3 0
Dehlie ditto, ..	11	91	231	336	93	0	19	221	36093 5 0	107 6 0
Bareilly School,	0	59	186	245	57	14	0	174	18887 3 0	77 1 0
Saugor ditto, ..	3	26	182	211	60	92	0	59	8568 4 0	40 9 0
Jubbulpore ditto,	1	46	210	257	47	115	0	95	5011 0 7	19 8 0
Total, ...	62	280	1364	1706	427	312	108	1102	155073 6 0	90 14 0

Agra College.

The Agra College under its able Principal continues to flourish. The Institution is favored in its locality, which, as the seat of Government, and an emporium of considerable trade, possesses a population of more than usual intelligence and acuteness. The steady and increasing demand for the services of the more advanced Students, thirty of whom have found employment during the past year, affords the best proof of the sound and practical nature of Mr. Middleton's system of instruction.

Dehlie College.

Owing to the prolonged absence of Dr. Sprenger, the Principal, at Lucknow, and his subsequent illness, the superintendence of the Dehlie College has, during the past year, devolved almost entirely upon Mr. Taylor, the Head Master, whose management appears to have been judicious and successful. Dr. Sprenger has, since the close of the period under review, been transferred to Calcutta, and his place at Dehlie supplied by Mr. Cargill, late Principal of the Dacca College.

Benares College.

At Benares Dr. Ballantyne still presides over an Institution, which owes much of its peculiar interest to his individual exertions. In the body of the Report will be found an interesting account of the progress and effects of his system, which is apparently working well, and may be expected to produce important results. Dr. Ballantyne's hands have been lately strengthend by the appointment of an Assistant, Mr. F. E. Hall, who is represented as well qualified to be an efficient coadjutor in his labors.

Roorkee College.

The College of Civil Engineers at Roorkee has during the past year been placed upon a permanent footing, and its charges transferred from the Educational Fund to the general revenues of the country. The College gives earnest of great future usefulness, and the demand for the services of its passed members has already become so great, as to necessitate a considerable enlargement of the limited numbers of the lower departments. Some misapprehension is stated by the Principal to exist, both as regards the entrance-examination, and the qualifications necessary for success in the peculiar branch of study, to which the College is devoted. The Report will be found to contain the fullest information on these points, as well as on the general system and aim of the Institution.

In the notices of the Dehlie and Benares Colleges it will be observed, that complaints have been made of the difficulty, which even their best pupils sometimes experience in their search after employment, and that it has been proposed, as a remedy for the evil, that a certain salary should be guaranteed by the Government to all

Students, who should attain to a fixed high standard of proficiency. Such a measure does not however appear to be called for. It is the aim of every officer to secure to himself the best subordinate talent available, and in the competition thus excited a good and sound education must in the first instance be most useful to its possessor. The degree. to which it may ultimately prove so, must depend upon himself. Habits of subordination, honesty, and self-exertion are of even greater importance to success in life, than mere talent or erudition; and these would be more likely to suffer than to gain by a system, which would tend to make every clever boy believe himself an especial protége of the Government, and rely for his future position, more on the favor of others, than on his own exertions.

Since the commencement of the present year, the sanction of the Home Government has been received to the introduction into the eight districts noted in the margin,* of an uniform system for the supervision and extension of Village Schools.

* Muttra, Agra, Bareilly, Etawah, Furruckabad, Mynpooree, Allygurh, Shahjehanpoor.

The enquiries and correspondence which have led to the acknowledgment of the necessity of this step, and the measures consequent upon them, have been so fully detailed in a memoir lately printed by the Government, North Western Provinces, as to require no further notice. Experience only can demonstrate the effects of these measures on the constitution of the Government Educational Institutions. It may however be expected, that they will share in the benefits, consequent on the enlarged intelligence and knowledge of the masses, and become ultimately, what their constitution and position fit them to be, the institutions in which the best and most able Scholars of the District Schools, will receive higher instruction and greater rewards, than are afforded by their own local establishments.

In the Appendix will be found Revised Statements Nos. 1 and 2 of the Receipts and Disbursements of the Education Department for the official year 1848-49, with the *actual* closing balance at its termination.

Statement A exhibits the balance in favor of the Department at the close of 1847-48, and the receipts during the following year at an aggregate of Rs. 8,21,572-15-1. The disbursements during the same period as shewn in B, amounted to Rs. 2,14,775-12-5, with a closing balance of Rs. 6,06,797-2-8, distributed as follows:—

Stock with Government Agent, ...	5,63,561	14	6
Stock with Local Committee at Benares, ...	5,000	0	0
Cash Balance with several Local Committees,	6,849	14	4½
Balance on the Books of the Accountant, ...	31,385	5	9½
Total Rupees,	6,06,797	2	8

No charges connected with the large expenditure incurred since July 1847, on account of the construction of the College buildings at Benares, which up to the 31st January 1850, amounted to Rs. 66,188-7-3, on the Benares Collector's Inefficient Balance, had been brought under adjustment: and advances amounting to Rs. 19,000, stood against the Principal of the Civil Engineering College at Roorkee.

Immediately following these Statements will be found two others, Nos. 1 and 2 in which an *Estimate* is given of the probable Receipts and Charges of the same Fund for the year 1849-50. Statement No. 1 exhibits the Actual Balance in favor of the Department at the beginning of and the Receipts during the official year 1849-50, at an aggregate of Rs. 8,06,990-15-3. The Disbursements, during the same period as shewn in No. 2, were Rs. 1,79,472-10-11, leaving a probable closing Balance on the 30th April 1850, of Rs. 6,27,518-4-4, distributed as follows:—

Stock with Government Agent, ...	5,63,561	14	6
Stock with Local Committee at Benares,.....	5,000	0	0
Cash Balance with Local Committees,.....	4,357	14	3
Probable closing Balance on the Books of the Accountant, ...	54,598	4	4
Total Rupees,	6,27,518	4	4

In conformity with instructions communicated by Government on the 28th June 1849, all expenditure incurred on account of the Roorkee College, subsequently to April 1849, had been charged to the General Funds of the State.

The amount placed to the debit of the Benares College, in the Inefficient Balance of the Benares Collectorate had fallen to Rs. 53,029-15-3. The reduction had been due to a Transfer from Deposits of sums subscribed by various parties for the embellishment of the buildings.

General Statement of the Number, Caste, &c., of the Students, on the 30th April 1850.

Names of Institutions.	Number of Students.				*Average attendance.*
	Christians.	*Hindoos.*	*Mahomedans*	Total.	
Agra College, ...	41	337	39	417	*
Dehlie College, ...	11	231	94	336	315
Benares College, ...	6	218	16	240	189
Bareilly School, ...	0	186	59	245	*
Saugor School, ...	3	182	26	211	*
Jubbulpore School, ...	1	210	46	257	*
Total, ...	62	1364	280	1706	

* Not given in Annual Returns.

AGRA COLLEGE.

27TH YEAR.

Local Committee of Public Instruction at Agra as on the 30th April 1850.

NAMES.	DESIGNATION OF OFFICE.
C. Grant, Esq., ..	Accountant, N. W. P.
J. Thornton, Esq., ..	Secretary to Government, N. W. P.
W. Muir, Esq., ..	Secretary to the Sudder Board of Revenue, N. W. P.
J. S. Boldero, Esq., ..	Civil and Sessions Judge of Agra.
H. S. Reid, Esq., ..	Superintendent General of Village Schools, N. W. P.
P. B. Reid, Esq., ..	Deputy Magistrate and Deputy Collector of Agra.
R. Thornton, Esq , ..	Assistant Secretary to Government, N. W. P.
Captain J. W. Oldfield, ..	Executive Engineer, Agra Division.
J. Middleton, Esq., ..	Secretary, Local Committee Public Instruction.

AGRA COLLEGE :
The 17th June, 1850.

(Signed) J. MIDDLETON,
Secy. L. C. P. I., Agra.

Establishment of the Agra College as it existed on the 30th April 1850.

DATE OF APPOINTMENT.	NAMES.	DESIGNATION.	AMOUNT OF SALARY
1st Feb., 1845, ..	J. Middleton, Esq.,..	Principal, ...	600 0 0
25th April, 1844,	J. K. Williams, Esq.,	Head Master, ...	400 0 0
25th April, 1846,	Mr. J. F. McConnell,	2nd ditto, ...	200 0 0
	Office vacant, ...	3rd ditto, ...	130 0 0
29th August, 1848,	Mr. J. W. Beale, ..	4th ditto, ...	100 0 0
20th Feb., 1847,	Kedarnath, ...	5th ditto, ...	50 0 0
	Kulyan Singh, ...	6th ditto, ...	25 0 0
30th Jan., 1849,	Nejabut Ali, ...	7th ditto, ...	16 0 0
	Moolchund, ...	8th ditto, ...	14 0 0
28th Dec , 1842,	Mr. J. F. McConnell,	Writing ditto,.....	30 0 0
9th Jan., 1846, ..	Mr. N. Parsick, ...	Teacher of Land Survey, ...	200 0 0

Date of Appointment.	Names.	Designation.	Amount of Salary.
3rd Nov., 1816, ..	Ishry Pershad, ...	Assistant Mathematical Professor,	100 0 0
7th August 1845,	Sudeed-ooddeen,....	Arabic ditto,*	100 0 0
21st Jan., 1817,..	Abool Hussun, ...	1st Persian Teacher,	60 0 0
19th August, 1824,	Mahomed Raheem,..	2nd ditto ditto, ...	30 0 0
5th Feb, 1850,	Kureemoodeen, ...	1st Oordoo ditto, ..	50 0 0
	Asghur Ali, ...	2nd ditto ditto, ..	30 0 0
9th ditto, 1846, ..	Chirunjee Lall, ...	3rd ditto ditto, ..	14 0 0
19th August 1824,	Kewul Ram, ...	1st Sanscrit ditto, ..	60 0 0
15th March, 1841,	Heera Lall, ...	2nd ditto ditto, ...	20 0 0
3rd Nov., 1848, ..	Munnoo Lall, ...	1st Hindee ditto, ..	50 0 0
8th August, 1848,	Kesho Pershad, ...	2nd ditto ditto, ...	30 0 0
8th May, 1826, ..	Choonnee Lall, ...	3rd ditto ditto, ...	20 0 0
15th August, 1825,	Shunkur Lall, ...	Hindi Arithmetic do.,	30 0 0
	Establishment.		
30th Jan., 1849,..	Naseer Khan, ...	Librarian, ...	25 0 0
3rd May, 1841, ..	Chunnoo Lall, ...	English Writer, ...	16 0 0
		2 Duftrees @ 5 and 4,	9 0 0
		1 Furrash, ...	5 0 0
		1 Bhishty, ...	7 0 0
		1 Chuprassee, ...	4 0 0
		2 Chokeedars @ 4 each,	8 0 0
		2 Brahmins @ 3-8 each, ...	7 0 0
		1 Sweeper, ...	4 0 0
		Contingencies,.....	4 0 0
		Total Rs., ...	2448 0 0
29th Feb., 1848,	Mr. S. W. Fallon, ..	Supernumerary, ...	250 0 0
24th Feb, 1849,	Mr. G. Wiggins, ..	ditto, ...	250 0 0
	Grand Total Company's Rupees...		2948 0 0

E. E.

(Signed) J. MIDDLETON,

Secy. L. C. P. I., Agra.

Agra College:
The 17th June, 1850.

List of Scholarships in the Agra College as they existed on the 30th April 1850.

Names.	Designation.	Amount of Scholarship.	Remarks.
	English Department.	R. A P.	
Kunhya Lall 1st, ..	Senior Scholar, ..	40 0 0	
Sookh Deo Buksh,..	Ditto, .	25 0 0	
A. Sharpley, ..	Ditto, ..	25 0 0	
Ameer Khan, ..	Ditto, ..	16 0 0	H H the Maharajah of Bhurtpore's Scholarship.
Kunhya Lall 2nd, ..	Junior Scholar, ..	8 0 0	
Jno. Fyze Museeh,..	Ditto, ..	8 0 0	
M. Harris, ..	Ditto, ..	8 0 0	
Choonnee Lall, ..	Ditto, ..	8 0 0	
Balmokund, ..	Ditto, ..	6 0 0	
Shiv Churn, ..	Ditto, ..	4 0 0	
Kunhya Lall 1st, ..	Anglo Vernacular, ..	16 0 0	
Ameer Khan, ..	Ditto, ..	8 0 0	
Hurg an, ..	Ditto, ..	8 0 0	
	Oriental Department.		
Nisar Ali, ..	Senior Arabic, ..	16 0 0	
Bunarsi Khan, ..	Ditto, ..	16 0 0	
Fyzeoollah, ..	Junior Arabic, ..	8 0 0	
Vajid Ali, ..	Ditto, ..	6 0 0	
Kulyan Singh, ..	Senior Persian, ..	16 0 0	
Roohoolla, ..	Ditto, ..	16 0 0	
Bhugwat Pershad, ..	Ditto, ..	16 0 0	
Jugutnarain, ..	Ditto, ..	16 0 0	
Sheonarain, ..	Junior Persian, ..	6 0 0	
Bhugwant Dial, ..	Ditto, ..	4 0 0	
Ameer Chund, ..	Ditto, ..	4 0 0	
Bainee Pershad, ..	Senior Sanscrit, ..	12 0 0	
Sree Gopaul, ..	Junior ditto, ..	6 0 0	
Kalee Churn, ..	Ditto, ..	6 0 0	
Shiv Rakhun, ..	Ditto, ..	6 0 0	
Salig Ram, ..	Ditto, ..	4 0 0	
Gokul Chund, ..	Ditto, ..	4 0 0	
	Total Co.'s Rs. ..	342 0 0	

Agra College: *The 17th June*, 1850.

E. E. (Signed) J. MIDDLETON, *Secy. L. C. P. I., Agra.*

Statement of the Number, Caste, &c. of the Students of the Agra College as on the 30th April 1850.

Statement shewing the number of Students paying, and the amount paid by them; and Students who do not pay, as also the amount of Entrance Fees on the 30th April 1850.				*Statement shewing the number of Students studying each of the languages taught, on the 30th April 1850.*						*Statement shewing the number of Students on the 30th April 1850.*			
Non-paying.	Paying and amount realized during the year deducting the expense of collection.	Amount of Entrance Fees realized during the year.	Total.	English.	Arabic.	Persian.	Oordoo.	Sanscrit.	Hindee.	Christians.	Mahomedans.	Hindoos.	Other than these three.
191	10 at 5 Rs. each. 6 at 3 Rs. each. 28 at 1 Re. each 182 at 8 As. each 226 Rs. As. P. 1643 11 7 96 0 0 1547 11 7	Rs. As. P. 290 0 0	Rs. As. P. 1837 11 7	391	19	144	157	31	91	41	39	337	
										Total, ... 417			

(Signed) J MIDDLETON,

Secy. L. C. P. I., Agra.

AGRA COLLEGE:
The 17th June, 1850.

Statement of the Receipts and Disbursements of the Agra College during the official year 1849-50.

| Separate Fund. | Resources of Annual Income. | | |

The annual examination commenced about the middle of November, and lasted with little interruption for more than a month. The public distribution of prizes was postponed till the return of the Lieutenant Governor to Agra.

The average attendance during the year had been good, but the muster roll of the Students on the 1st December shewed a diminution of 18 in the numerical strength of the College, as compared with that of the preceding year. The number attending at the close of 1849 was 381, of whom 140 were paying pupils.

The following Students, 30 in number, had during the past year succeeded in finding employment in Public Offices or elsewhere, and had consequently left the Institution. The largeness of the number may perhaps account for the slight falling off in the list of the College.

List of Students of the Agra College who have obtained employment during the year 1849.

No.	Names.	Class.	Nature of Employment.	Amt. Mon. Salary.		
1	Dwarkanath, ..	1st,	Agra Accountant's Office.	60	0	0
2	J. P. Casabon, ..	,,	Commissioner's Office, Almorah, ..	60	0	0
3	Hurry Churn, ..	,,	Roorkee College, ...	51	4	0
4	Kunhya Loll (2).	,,	Teacher, Jeypore School,.... ..	60	0	0
5	Gopal Singh,....	,,	Agra Accountant's Office, ...	60	0	0
6	Chiroungee Loll,	,,	Ditto ditto, ...	15	0	0
7	W Hutton.	,,	Ditto ditto, ...	30	0	0
8	Mohun Loll,....	,,	Medical College, Fort William, ..	18	0	0
9	Rooghan Pershad,	,,	Ditto ditto, ...	18	0	0
10	Mahomed Mirza,	2nd,	Moonshee to the Nawab of Jowrah, ..	40	0	0
11	Mool Chund, ..	,,	Eighth Master, Agra College, ..	11	0	0
12	Kalee Dass, ...	,,	Writer, Sudder Board of Revenue, N. W. Provinces,	15	0	0
13	Kishen Loll, ...	,,	Punjab Accountant's Office, ..	30	0	0
14	Bunsee Loll, ...	,,	Apprentice, Accountant's Office, Agra, ..	0	0	0
15	Naseer Khan, ..	3rd,	Librarian, Agra College, ...	25	0	0
16	Umbica Churn, ..	,,	Punjab Accountant's Office,.. ..	20	0	0
17	Raja Ram, ...	,,	Agra Accountant's Office,.... ..	15	0	0
18	Ram Churn, ...	,,	Apprentice, Agra Collectorate, ..	0	0	0
19	Jugganath Singh,	,,	Ditto, Commissioner's Office, Agra, ..	0	0	0
20	Chowree Persnad,	,,	Ditto, ditto ditto, Agra, ..	0	0	0
21	Goverdhun, ...	,,	Ditto, Commissariat Office, Agra, ..	0	0	0
22	Bhugwan Dass,..	,,	Ditto, Civil and Sessions Judge's Office, Agra,	0	0	0
23	Bindrabun, ...	,,	Ditto, Agra Bank, ...	0	0	0
24	Pearee Mohun,..	5th,	Writer, Agra Bank, ...	10	0	0
25	Madho Chund,..	,,	Ditto, ditto Assay Office,.. ..	20	0	0
26	Savuk Ram, ...	,,	Ditto, ditto Orphan Press, ..	8	0	0
27	Pooran Chund,..	,,	Agra Accountant's Office, ...	15	0	0
28	Madho Chunder,	2nd,	Deputy Commissary General's Office, ..	30	0	0
			Oriental Department.			
1	Jaffur Ally, ...	Arabic,	Dâk Moonshee, Bhopal, ...	20	0	0
2	Ally Jan, ...	1st Persian,	Agra Collectorate, ...	15	0	0

The majority of these had of course been taken from the Senior Classes, and the effect of their withdrawal had been to lower both the numbers and attainments of that division of the College. Of 17 Students, with whom the Senior Class had opened at the commencement of the year, only seven remained at its close. This demonstration of the practical value of the College education cannot be regretted, but its effects should be taken into account, when considering the results of the general examination.

During the past year, attention had been paid to the Surveying Class, to which a supplementary branch had been added, so as to admit of its being joined by such youths of the Oriental Department, as might show a liking and aptitude for the pursuit; the Students of the English branch had gone through the usual operations of surveying a tract of country, and projecting it from their field books, laying down a line of levels, &c. &c.; the Oriental branch had been but lately established, and its members had consequently attained no great degree of proficiency. They were, however, reported by their Master to be attentive and intelligent, and may therefore be expected to make good progress.

The following reports on the examination of the Classes in their several branches of study will afford the means of judging of their attainments.

ENGLISH DEPARTMENT.

Ninth Class. This Class consisted of 65 Students, and had been taught by Pundit Kedarnath. The two parts into which it was divided had been engaged alternately in the study of the Vernacular and English. The boys acquitted themselves creditably on the whole, though their pronunciation of some of the English letters was inaccurate.

Eighth Class. This Class, under Pundit Moolchund, consisted of 57 Students, and was divided like the Class below into two divisions. The Arithmetic, Reading and Explanation of the Class were considered to be good, as no fault of sufficient consequence to require notice was detected. The Writing was good also, and in some instances left little to be desired as far as mere penmanship went. The Class reflected much credit on its teacher.

Seventh Class. This Class, under Moonshee Nejabut Ali, consisted of 55 Students, forming two divisions. The pronunciation was less accurate than in the Class below, as the improvement evinced at the previous examination had not in this respect been followed up. The Arithmetic and Writing were tolerably good, and though in Grammar no great progress had been made, the answers were generally accurate.

Sixth Class.

This Class, under Kulyan Singh, consisted of 70 Students, and like the Classes below was divided into two parts. The youths of the Senior Division acquitted themselves creditably in Reading, Explanation and Grammar, those of the Junior Division deserved less praise. In Arithmetic the result was very satisfactory, the answers to the questions put were given with readiness, while the operations were neat and well arranged: the Writing was also good generally, in some cases particularly so, and the youths showed themselves to be well grounded in the Geography of Asia.

Fifth Class.

This Class, under Mr. J. Beale, numbered 33 Students, who acquitted themselves well in all respects; the proficiency of none of its members was remarkable, but their average attainments ranged higher than ordinary; their intelligent Master had aimed rather at raising the general standard of the pupils under him than at forcing a few at the expense of neglect of the many.

Fourth Class.

This Class, under Mr. Wiggins, was examined *vivâ voce* in literature by Mr. P. B. Reid, who observed,—"On the whole, I should say that the Class is not so good as last year. This I believe is owing to the Seniors of last year, having obtained promotion to a higher form; many though of the boys acquitted themselves well in explaining the portion read, they not only gave the correct meaning of the words, but seemed to me to have compassed the idea intended to be conveyed. I tried some in various ways by translation of sentences into Oordoo, and the result was satisfactory. It was evident to me that the Master of the Class must have taken pains in explaining to the boys. The Grammar generally was good but admitted of improvement. The enunciation of some of the boys is very defective."

The arithmetical attainments of the Class were tolerably good, though in some cases the processes were found to be wanting in neatness and precision; a defect which, though noticed in former reports, has not yet been thoroughly corrected. The boys had an accurate knowledge of Geometry, and evinced a satisfactory comprehension of first principles. The Geography which heretofore had been so unsatisfactory, showed marked improvement: it had evidently become a study of greater interest to the youths than it had formerly been, and Mr. Wiggins deserved credit for the care which he had bestowed upon it. The translation and dictation were fair.

Third Class.

This Class consisted of 24 Students, had been taught in literature generally by Mr. McConnell. In the *vivâ voce* examination the youths acquitted themselves very indifferently, though perhaps somewhat better than at

the examination of the preceding year, their knowledge of Geometry was less creditable to the Professor than that of the Class below. For instance no Student succeeded in demonstrating the truth, important for its practical bearing, contained in a corollary to a proposition of the 2nd book of Euclid, "the rectangle contained by the sum and difference of two straight lines is equal to the difference of their squares," a failure which could scarce have occurred, had the Professor been in the habit of pointing out and dwelling upon important deductions from propositions. The youths however acquitted themselves much better in Algebra, answering the questions put to them accurately and neatly, and shewing that pains had been bestowed upon them in this respect. The dictation and translation were both creditable: the latter subject had been superintended by Mr. Fallon, a painstaking and successful teacher, who conducts the same studies in the Classes above. The Geography of this Class, like that of the Class below had been taught by Mr. Wiggins, and was decidedly improved since the former examination.

Second Class.

This Class consisted of 15 Students. In Literature it had been superintended by the Head Master, and in Science had been taught by Assistant Professor Ishry Pershad. Mr. C. C. Jackson, who undertook the *vivâ voce* part of the literature examination remarked,—"The reading generally merits commendation; all or most of them seem sensible of the force of the author's language, and their pronunciation is tolerably correct; indeed it is very satisfactory to perceive that so much pains have been taken with this part of their education. In the explanations, they generally evinced a knowledge of the meaning of the author, though their command of the English language did not enable them to express themselves with fluency. From the younger pupils of this Class, much improvement may be expected; but I regret to observe that the advanced ages of many will probably be an obstacle to their pursuing the study of a foreign language with any great hope of their attaining a perfect knowledge of it."

In History the Class had made creditable progress, as also in the Elements of Political Economy, while in Geography there appeared, as in the Classes below, marked improvement; and the same may be said of the translations from and into the vernacular: the Writing from dictation was also found to be good. The Geometry, Algebra and Arithmetic were on the whole creditable. In the two first of these branches, although no great progress had been made, the youths had mastered what they professed to have learnt, and hence future progress might be expected to be good. The numbers to the answers in Arithmetic were rather low, but this should be ascribed to the circumstance that the questions were pitched somewhat high, so as to suit the Senior Class also.

In Mechanics the youths acquitted themselves very creditably: they had been instructed by the Assistant Professor, who had evidently bestowed much care upon them. In addition to their ordinary studies, this Class had had the advantage of attending the Principal Lectures, and they seemed to have benefited by the privilege.

Senior English Class.

This Class consisted of eight Students, one of whom Kalee Churn had been lately promoted. Its standard of attainment had been much lowered by the withdrawal, during the session, of most of its advanced members.

The *vivâ voce* part of the examination in Literature proper was taken by Mr. C. C. Jackson, who remarked as follows:

"In returning the list of Students of the 1st Class, numbered according to merit, it is proper to state that I was much gratified with the reading and the intelligence shown by the explanations given by the Students of this Class, but particularly with those of the four Senior, whose correct enumeration and accent show that great pains have been taken with them."

Mr. R. Thornton, who examined the answers to the written questions upon the same subject reported upon them as follows:

"Of the first Division of the 1st Class, A. Sharpley's paper is decidedly the best, both as respects substance and diction; some of the questions are very well answered, and his replies show that he has understood and recollected what he has read. The same may be said with regard to most of the answers of Kunhya Lall, which are much superior to those given by the other two members of this Division, and show a very fair knowledge of the subject which he has studied. In the second Division the paper of Kalee Churn is superior to those of his companions, and fully entitles him to a place in the first Division; his answers in fact show a greater knowledge of Grammar and a better appreciation of what he has read than those of any of the Students in either Division, with the exception of the two first mentioned; the remaining members of this Class appear to have read to but little profit to themselves. It would be as well if more attention were bestowed on the grammatical study of the English language. One cannot expect boys to have the power of appreciating Milton or Shakspeare, when they are unable to form a single sentence with accuracy. The best of these papers are deformed by frequent grammatical errors, from which one alone is particularly free; and that one written by a boy whose name betrays his English parentage."

Mr. C. C. Jackson, who had given the subject and examined the Essays, awarded the Medal to Kunhya Lall, of whose Essay

he remarked, "His powers of composition are not very great, but there is much good sense in the matter, and the errors of Grammar are very few. I think it a very good Essay."

Mr. R. Thornton reported upon the answers to the Historical questions, as follows. "Sharpley and Kunhya Lall should be bracketed together: the slight inferiority of the answers of the former in matter being compensated for by their superiority in style and idiom. Some of their answers are very good, and their papers generally show that they have read with care, and recollected with accuracy. The acquirements of the remainder of the Class are very inferior. They have answered some questions well, but failed entirely in others: while their knowledge of English is so indifferent that it is sometimes difficult to understand what they mean. Dabidas and Azim Buksh enjoy a bad pre-eminence, and scarcely appear to deserve the high position to which they have attained in the English Department of the College. It would be well if more attention were paid to perfecting and grounding the Students in the idiomatic use of English. If a language be worth acquiring at all, it is worth while to do so with accuracy; and it is of much importance to the future prospects of the eléves of the College, that they should be able to appreciate the full meaning of what they read, and to compose with ease and fluency. Except they attain this power while at the Institution we can hardly expect that after leaving it they will retain any taste for a literature which they cannot appreciate, and the study of which will appear a painful task after they have been deprived of their present stimulant to exertion."

The papers on Mathematics were examined by Lieutenant Maclagan, who reported as follows. "I have examined with some care the Mathematical papers which you sent me, and which I now return, and have, as you requested, assigned what appear to me to be the respective values of the several papers. I would observe that the task of examining such a batch of papers, would be greatly lightened by a more clear and careful style of writing on the part of the Students, the want of which in these first Class men, an especially serious defect in Mathematical papers, I have been much struck with. Kunhya Lall is evidently far ahead of all the others in acquaintance with the subjects of examination, but he too not unfrequently avoids the simple and more obvious modes of solution, at the expense at the same time, of neatness and conciseness."

In Blackstone the Senior youths showed a tolerable acquaintance with the 1st Volume, but their reading in the 2nd Volume did not appear to have been of much use to them.

A set of questions on Arithmetic was put to the Class with a view to guard against the neglect of that useful branch of study in favor of more advanced, though less practical ones. The precaution

appeared to have been necessary; since notwithstanding that a similar paper had been set at the preceding examination, several of the Students evinced much ignorance of the subject. The more advanced acquitted themselves creditably, but the others failed signally; one of them, Hurgyan could not answer a single question, or even make a tolerable attempt at it.

Mr. Muir who examined the translations to and from the Vernacular, reported on the result as follows:

"For the Anglo-Oordoo examination only eight candidates "have come forward, or at least given in papers. The paper sent "was an easy passagefrom an English author to be put into Oordoo, "and a portion of the Bagh-o-bahar, into English. The result "is as follows:—

	Full Mark 50 *English into Oordoo.*	*Full Mark* 46 *Oordoo into English.*	*Full Mark* 50 *Writing and Spelling.*	TOTAL.
Kunhya Lall, ...	29	30	20	79
Ameer Khan, ...	26	29	23	78
Sookhdeo Buksh, ...	24	22	21	67
Azim Buksh, ...	28	24	15	67
Kalee Churn, ...	24	31	bad	55
Dabé Dass, ...	18	25	5	48
A. Sharpley, ...	8	28	0	36

"Hurgyan.—This youth gave in excellent papers, but as they are translations from and into Hindee and English, they cannot be properly classed with the above.

"It will be observed that with the English pupils, the Oordoo writing and orthography is still at a low ebb. With the lower Classes, however, which are to form the materials hereafter for our higher forms, I think there is some improvement in this particular. Caligraphy and writing from dictation have, I observe, been practised

throughout the year to a considerable extent, and if the system be steadily pursued, incorrect writing and spelling being invariably noticed by the master,—I have no doubt a correct habit of writing will be imparted before the youths reach the higher branches, when they have no time for such training."

"Upon the whole the Persian and Oordoo written examinations may be regarded as a little more favorable than last year, and more might have been expected had not the higher ranks of the College been much thinned by the departure of most of the best Students."

SANSCRIT DIVISION.

3rd Hindee Class.

This Class, under Pundit Choonnee Lall, consisted of 32 Students. The reading and explanation was found to be generally good. The Pundit had taught a few of the higher youths a little Grammar in addition to the reading prescribed, and had thus manifested a zeal and interest in the advancement of his Students creditable to him.

2nd Hindee Class.

This Class, under Pundit Kesho Pershad, consisted of 24 Students, and, except as regards their defective spelling, acquitted themselves well.

Senior Hindee Class.

This Class, under Pundit Munnoo Lall, was examined by the Senior Sanscrit Pundit, who reported favorably as to the attainments of the youths, and gave them full marks in almost every thing. Mr. J. Muir subsequently examined some of the Seniors, and remarked,—"I examined the three boys at the head of the list, *ad apertionem libri*, in the Hindee Mahabharat, and found they could read and explain the meaning of it well, and also parsed it accurately."

Hindee Arithmetic Class.

This Class, under Pundit Shunker Loll, contained 41 Students, including those of the Senior English Class; the text books had been the Beej Ganit and Lilavati: the attainments of the youths were various, but on the whole the Class might be considered creditable to its Master.

Junior Sanscrit Class.

This Class, under Pundit Heera Loll, consisted of 16 Students, and was examined by the Senior Pundit by written questions: in his opinion it was creditable to its teacher.

Senior Sanscrit Class.

This Class, under Pundit Kewul Ram, contained 14 Students. The papers were examined under the direction of Dr. Ballantyne of the Benares College, who reported as follows:—

"The Pundits report that there is decided improvement on the last year's examination; and if the Students will read the Sanscrit lectures 'on the mutual relations of the sciences' which have been printed for the use of the Benares College, I shall be glad of the opportunity of ascertaining, at the next examination, how far this concise exposition of European science is intelligible to a Sanscrit Student unaided by a teacher."

Koonj Behary, the Senior Sanscrit Student, who has held a Senior Scholarship for the full period of three years, and has moreover reached the limit of holding in respect of age, was highly spoken of by the Benares Pundits. He has been an assiduous Student of English, and the sciences of the west.

ARABIC BRANCH.

3rd Junior Oordoo Class.

This Class consisted of 59 Students, under Moonshee Cheroonjee Loll, the progress ranged from the Alphabet to the Reading, Spelling and Explanation of simple stories; Spelling being an exercise of recent introduction, though now attended to throughout the Vernacular Classes. The youths acquitted themselves creditably on the whole, and their teacher had evidently taken pains with them.

2nd Oordoo Class.

This Class, under Moonshee Kareemooddeen, contained 47 Students. The Senior youths acquitted themselves very creditably, the Juniors much less so.

Senior Oordoo Class.

This Class consisted of 41 Students, who acquitted themselves creditably. Their teacher Moonshee Muslehooddeen had died towards the close of the session.

Junior Persian Class.

This Class, under Moonshee Mahomed Raheem, contained 75 Students. It was examined by Mr. Fallon, who reported favorably of the general results, though the Grammar, read only by about a third of the Class, seemed to have been very inaccurately studied. Several of the youths were well advanced, but the number of backward ones was above the average.

Senior Persian Class.

This Class consisted of 63 Students, under Moonshee Abool Hussen; and was examined by Mr. W. Muir, some of whose observations have reference to the Oordoo Classes, the two Senior of which were so far examined by him, *vivâ voce*, as to enable him to judge of their merits and defects.

"The *vivâ voce* examinations for the Persian Department were taken from the Quasaid Oorfee and Ikhlaq Jellali. The higher Students acquitted themselves tolerably well, and the result of the whole was, with some exceptions, satisfactory."

"The Oordoo Classes were examined orally in the Bagh-o-bahar. The attainments of the pupils I found to be very unequal: general questions as to the construction and meaning of what was read, I found to be badly answered. The mechanical system of word for word translation was, as far as it goes, tolerably well managed."

"I would press the *mode* of translations upon the attention of both Persian and Oordoo teachers. At present the most literal translation following the exact order of the original, is admitted; which in the case of Persian rendered into Oordoo, must of course often mangle, if not entirely alter, the original meaning."

"Another thing to be corrected is this. In Persian, the same word, even though an universally difficult one, is generally admissible as an Oordoo word also. Hence the pupil translates his Persian by simply introducing Oordoo verbs or auxiliaries, retaining the Persian Noun or Adjective as it stands. When asked the *meaning* of such word, I very often found the Student at a loss to give an explanation. As a general rule then I would desire, that in translation, an equivalent in another form, and if possible, from another root, should invariably be insisted upon: and that the sentence as given in Oordoo should be expressed according to the current usage of the language, and not be a slavish copy of the Persian idiom."

"In reading Oordoo too, the same principle should as far as possible be borne in mind; the teacher should see that the pupil understands the *meaning* of all unusual words and phrases."

"I examined the Arabic Class in the Muqamat Hureeree, Tawarikh-i-Timoor, and some elementary books. The number of good Arabic Scholars is now much reduced. The higher Class read tolerably; but I remark a similar blemish in their mode of translation to that noticed above."

Senior Arabic Class.

This Class contained 51 Students under Moulvee Sudeedoodeen; in addition to the remarks of Mr. Muir upon this Class, the Moulvees of the Dehlie College, who examined the answers to the written questions were reported by the Officiating Principal to have observed as follows:—

"Too many studies have been pursued at the same time by the Arabic pupils to admit of their making themselves thoroughly acquainted with any one of them. Deewan Mootanabi and Towzi. to be read

with benefit during twelve months, require undivided attention. But in the first Arabic Class, besides these two books, there are two others in every respect as difficult."

It should be observed, with reference to the remarks just quoted, that the two books mentioned had been read only in part, and that by youths who had been reading them the previous year also: so that whatever defects had been found, or were to be inferred from the qualified report of the Dehlie Moulvees, they could not be ascribed to over-reading. The Class has in fact been falling off for some years past, and should it continue to do so, it will become a subject for consideration whether it be advisable to continue it on its present footing.

Annexed is the list of Scholarships awarded by the Committee and sanctioned by Government to deserving Students, in both Departments, amounting to Rs. 326 per mensem, in addition to the Scholarship of Rs. 16 granted by His Highness the Maharajah of Bhurtpoor. The highest Scholarship in the English Department, viz. Rs. 40 per mensem, was bestowed on Kunhya Lall, in consideration of his general proficiency.

List of Scholarships, Occidental and Oriental, of the Agra College, awarded consequent on the annual examination for 1849.

No.	Names of Scholars.	Amount Monthly.	No.	Names of Scholars.	Amount Monthly.
	Occidental.	R. A. P.		Oriental Arabic.	R. A. P.
1	Kunhya Loll, 1st, ...	40 0 0	1	Nisar Ali, ...	16 0 0
2	Sookhdeo Buksh, ...	25 0 0	2	Bunarsi Khan, ...	16 0 0
3	A. Sharpley, ...	25 0 0	3	Fyzeoolla Khan, ...	8 0 0
4	Ameer Khan, Bhurtpoor Scholarship, ...	16 0 0	4	Vajid Ali, ...	6 0 0
5	Kunhya Loll, 2nd, ...	8 0 0		Senior Persian.	
6	Jno. Fyz Musech, ...	8 0 0	1	Kulyan Singh,..	16 0 0
7	M. Harris, ...	8 0 0	2	Roohoolla, ...	16 0 0
8	Choonnee Loll, ...	8 0 0	3	Bhugwut Pershad, ...	16 0 0
9	Balmokund, ...	6 0 0	4	Jugatnarain, ...	16 0 0
10	Sheo Churn, ...	4 0 0	5	Shonarain, ...	6 0 0
	Anglo Vernacular.			Junior Persian.	
1	Kunhya Loll, 1st, ...	16 0 0	1	Bhugwunt Dial, ...	4 0 0
2	Ameer Khan, ...	8 0 0	2	Umur Chand,..	4 0 0
3	Hurgyan, ...	8 0 0		Sanscrit.	
			1	Bainee Pershad, ...	12 0 0
			2	Sree Gopal, ...	6 0 0
			3	Kalee Churn, ...	6 0 0
			4	Shiv Rakhan	6 0 0
			5	Saligram, ...	4 0 0
			6	Gokul Chand,..	4 0 0
	Total Co's. Rs. ..	180 0 0		Total Co's. Rs. ..	162 0 0

Abstract.

Amount of Occidental Scholarships, ...	132
Ditto of Bhurtpore ditto, ...	16
Ditto of Anglo Vernacular ditto, ...	32
Ditto of Vernacular ditto, ...	162
Total Co's. Rs.	342

The Lieutenant Governor in reply to the Annual Report, urged on the Local Committee the necessity for taking steps to improve the general penmanship and idiomatic knowledge of English, the deficiency in which could only be overcome by constant practice in composition and a careful scrutiny of the style as well as matter of the written exercises. The general results of the examination and the state of the College were considered satisfactory, while the increase in the number of paying Students, and the success which so many of them had met with in their search after employment, were promising features in the progress of the Government Educational Institutions.

On the 10th July 1849, the Local Committee recommended to Government a claim preferred by the Principal of the College for the reimbursement of the sums expended on the laboratory attached to his own house, but devoted to College purposes, as the only place in which chemical experiments and preparations could be made with safety. Sanction was accordingly granted to the purchase of the building at a cost of 500 Rupees.

On the 12th July 1849, the sanction of Government was granted to a donation of 50 Rupees to each of the two Students of the College who had proceeded to study at the Medical College in Calcutta, to cover the expenses of their journey to the Presidency.

On the 30th July 1849, the Secretary Local Committee reported to Government, that the Robertson and Mansel Prizes had been awarded in the following manner :—

1. Kunhya Lall for the best History Paper.
2. Ditto ditto Blackstone.
3. Sookhdeo Buksh Translation.

Kunhya Lall was noticed by the Examiners in very high terms. It will be observed that he stands first in the Occidental and also Vernacular Department. He has since joined the Roorkee College.

On the 11th November 1849, the Lieutenant Governor sanctioned a plan submitted by Captain Oldfield for adding a wing to the College buildings for the purpose of a Lecture room and a Museum, &c. &c., at an expenditure not exceeding 15,000 Rupees. The building in question is now rapidly progressing towards completion.

On the 16th November 1849, the Secretary Local Committee reported the death of Moonshee Muslehooddeen, Senior Oordoo teacher in the College, an officer of whom the Committee had always made favorable mention.

On the 5th December 1849, a letter was received from the Secretary Council of Education Calcutta, stating that the two youths, who had been studying at the Medical College, (as mentioned in last year's printed Report), had absconded, and that every attempt at tracing them had proved unsuccessful. Dr. Mouat supposed that their dread of the practical duties of the Dissecting Room, and their dislike of the Bengal climate, had been the true reasons of their sudden departure. He at the same time requested that should they return to Agra, they might be treated with kindness, as their punishment would be likely to deter any others of the Agra Students from expressing a wish to go to Calcutta. On the 2nd February 1850, the Secretary Local Committee reported their return to Agra, and their wish to be readmitted on their former footing in the College, a request which the majority of the Committee were inclined to grant. The Lieutenant Governor in his reply observed that their conduct had neither been candid nor straightforward, and that sufficient consideration would be shown them, if the one, Rooghun Pershad, were re-admitted to the College on the usual terms, and the other, Mohun Lall, as a free Student, but without a Scholarship, to which however he would be eligible at any future examination.

On the 21st December 1849, Mr. Reginald Thornton was appointed a Member of the Local Committee Public Instruction at Agra.

On the 5th February 1850, the sanction of Government was granted to the following arrangements in the College, consequent upon the death of Moonshee Muslehooddeen: Moulvee Kareemooddeen, 2nd Oordoo teacher, was made Senior Oordoo teacher, and Moonshee Ali Usghur, an alumnus of the Dehlie College, was appointed to the latter vacancy.

On the 11th February 1850, the sanction of Government was granted to the scheme of studies proposed by the Committee for the examination of 1850. The scheme is given in the Appendix *in extenso*.

In April 1850, a second Edition of the Principal's Syllabus of Lectures on Experimental Philosophy was printed, and published by order of Government.

DEHLIE COLLEGE.

58TH YEAR.

Return of the Local Committee Public Instruction, as on the 30th April 1850.

NAMES.	DESIGNATION OF OFFICE.
Sir T. T. Metcalfe, *Bart*... ..	Commissioner of the Dehlie Division.
J. P. Gubbins, Esq , ...	Judge.
A. Ross, Esq., ...	Civil Surgeon.
Nawab Hamed Ali Khan, ...	
Moulavee Sudderooddeen, ...	Principal Sudder Ameen.
Rae Ramsurn Doss, ...	Deputy Collector.
A. Sprenger, Esq., ...	Secretary, (on sick leave).
Mr. F. Taylor, ...	Officiating ditto.

(Signed) F. TAYLOR,
Offg. Secy. Local Committee.

DEHLIE COLLEGE :
The 17th May, 1850.

Establishment of the several Departments of the Dehlie College, as on the 30th April 1850.

ENGLISH DEPARTMENT.

NAMES.	DESIGNATION.	SALARY.			DATE OF APPOINTMENT.
A. Sprenger, Esq., M. D.,	Principal, ...	600	0	0	19th March, 1845.
Mr. F. Taylor, ..	Head Master, ...	400	0	0	16th August, 1829.
Mr. E. Roberts, ..	2nd ditto, ...	200	0	0	19th Sept., 1846.
Mr. R. Steward, ..	3rd ditto, ...	150	0	0	12th October, 1843.
Mr. J. F. Goulding,	4th and Drawing Master,	150	0	0	4th July, 1848.
Wuzeer Allee, ..	5th Master, ...	50	0	0	12th April, 1841,
Hoosseinee, ..	6th ditto,..	40	0	0	1st May, 1841.
Ramkishun, ..	1st Oordoo Master, ..	80	0	0	1st January, 1831.
Sheopershaud, ..	2nd ditto, ...	40	0	0	1st June, 1833.
Noor Mohumed, ..	3rd ditto, ...	30	0	0	17th May, 1841.
Taruck Nath, ..	Writing Master,.. ..	30	0	0	10th June, 1838.
Radha Kishen, ..	Nagree Teacher,.. ..	8	0	0	1st July, 1841.
Shunkur Doss, ..	Librarian, ...	25	0	0	5th April, 1848.
Jeevun Ram, ..	English Writer, ...	13	0	0	5th April, 1848.
Noor Ali, ..	Duftree, ...	7	0	0	19th May, 1841.
	Carried over, ..	1823	0	0	

Names.	Designation.	Salary.	Date of Appointment.
	Brought forward,....	1823 0 0	
	3 Chuprassees @ 4 each,.	12 0 0	
	1 Durwan, ...	4 0 0	
	1 Furrash, ...	4 0 0	
	1 Chowkeedar, ...	4 0 0	
	1 Sweeper, ...	3 0 0	
	Contingencies, ...	20 0 0	22nd January, 1842.
	Prize Books, ...	20 13 4	4th January, 1843.
	Total, ...	1890 13 4	

ORIENTAL DEPARTMENT.

Mumlook Ali, ..	1st Arabic Teacher, ..	100 0 0	1st June, 1825.
Jafir Ali, ...	1st Shea ditto,.. ..	100 0 0	1st April, 1841.
Syed Mohomed, ..	2nd Arabic ditto, ..	60 0 0	1st June, 1825.
Soobhan Buksh, ..	3rd ditto ditto, ..	35 0 0	1th December, 1834.
Imam Buksh, ..	1st Persian ditto, ..	50 0 0	1st April, 1841.
Hussun Ali Khan, ..	2nd ditto ditto, ..	35 0 0	1st December, 1830.
Ahmud Ali,.. ..	3rd ditto ditto, ..	25 0 0	2nd October, 1830.
Ram Chunder, ..	1st Sanscrit ditto, ..	60 0 0	26th April, 1844.
Kidar Nath,.. ..	2nd ditto ditto, ..	20 0 0	1st April, 1841.
Ram Chundra, ..	Teacher of European Science,	100 0 0	28th February, 1841.
Ajoodhiapershad, ..	2nd ditto ditto, ..	50 0 0	28th February, 1846.
Syed Mohomed, ..	Writing and Nagree Teacher,	28 0 0	5th July, 1829.
Kurreem Buksh, ..	Arithmetician, ...	20 0 0	25th June, 1849,
Jeevun Ram, ..	English Writer, ...	12 0 0	5th April, 1848.
Radhakishun, ..	Treasurer, ...	10 0 0	16th April, 1829,
Ashruf Ali,.. ..	Moonshee, ...	10 0 0	15th Sept., 1831.
Ditto, ...	Librarian, ...	10 0 0	1st January, 1833.
	4 Chuprassees @ 4 each,.	16 0 0	
	1 Furrash, ...	4 0 0	
	1 Chowkeedar, ...	4 0 0	
	2 Bheestees @ 4 each, ..	8 0 0	
	1 Kahar, ...	4 0 0	
	1 Gardener, ...	4 0 0	
	2 Sweepers @ 3 each, ..	6 0 0	
	Contingencies, ...	16 0 0	
	Prize Books, ...	20 0 0	
		807 13 4	
		2698 10 8	
	Deduct Escheat Fund, ..	250 0 0	
	Total Co.'s Rs...	2418 10 8	

Statement of the Number, Caste, &c., of the Students, as on the 30th of April, 1850.

Statement shewing the number of paying Students and the amount paid by them, and Students who do not pay on the 30th April 1850.					*Statement shewing the number of Students stydying each of the languages taught on the 30th April* 1850.				*Statement shewing the number of Students on the 30th April* 1850.		
Non-paying.	Paying.	Total.			English.	Arabic.	Persian.	Sanscrit.	Christians.	Mahomedans.	Hindoos.
		Rs.	As.	P.							
	6 at 5 Rs each 1 at 3-12 Rs. each 3 at 3 Rs. each. 13 at 1 Re. each. 102 at 8 As. each.										
211	125	982 24	10 0	0 0	224	43	50	19	11	94	231
		958	10	0					336		

170 of the Pupils in the English Department, and 19 of the Sanscrit Department study Oordoo; 11 English Pupils study Persian; 68 of the Pupils in the English College, and 93 of those in the Persian Department of the Madrissa study Nagree.

The daily average attendance of the Students from the 1st May 1849 to 30th April 1850 is 210 in the English and 105 in the Oriental Department.

DEHLIE COLLEGE :
The 17th May, 1850.

(Signed) F. TAYLOR,
Offg. Secy. L. C. P. I.

Statement of Receipts and Disbursements of the Dehlie College, from 1st May 1849 to 30th April 1850.

Resources of Annual Income.									Actual Charges for 1849-50.		
Separate Fund.		Assignment from Parliamentary Grant.	Total.	Assignment from additional grant dated 16th Dec. 1840.	Establishment and expenses as fixed by Government in their letter dated the 16th Dec. 1840.	Additional grant for prize Books, dated 4th January 1843.	Tuition Fees.	Grand Total of Receipts.	Nature of Charges.	Items.	Total.
Escheat Fund,	3000 0 0								**English Department.**		
Endowments from Nuwab Itmad-ood-Dowlah, ..	7253 5 4								Principal, ...	2926 5 6	
									English Masters,..	10087 4 10	
									Drawing ditto, ...	1695 2 6	
									Vernacular ditto, ...	1800 0 0	
									Writing ditto, ...	360 0 0	
									Nagree ditto, ...	96 0 0	
									Librarian, ...	300 0 0	
									Establishment, ...	564 0 0	
									English Scholars, ...	3908 0 0	
									Contingencies, ...	240 0 0	
Total, ...	10253 5 4	8658 10 8	18912 0 0	21168 0 0	40080 0 0	500 0 0	982 10 0	41562 10 0	Prize Books,..	250 0 0	22226 12 10
									Oriental Department.		
									Arabic, Persian & Sanscrit Teachers, ...	6388 10 7	
									Teachers of European Science,	1800 0 0	
									Establishment, ...	1056 0 0	
									Oriental Scholars, ...	4179 14 5	
									Contingencies, ...	192 0 0	
									Prize Books,..	250 0 0	13866 9 0
									Total	Co.'s Rs., ..	36093 5 10

Dehlie College:
The 17th May, 1850.

(Signed) F. TAYLOR,
Offg. Secretary L. C. P. I.

The annual examination commenced on the 27th November and ended on the 21st December. The prizes and medals were distributed on the 24th of the same month.

The number of Students on the rolls of the College at this date was 333, or nearly the same as at the corresponding period of the preceding year. There had been a slight falling off in the attendance in the Arabic and Persian Departments, but it had been compensated by an increase in those of English and Sanscrit.

Date.	*Free.*	*Paying.*	*Total.*
		ENGLISH.	
December 1848,	181	37	218
Ditto 1849,	153	81	234
		ARABIC.	
December 1848,	59	1	60
Ditto 1849,	41	4	45
		PERSIAN.	
December 1848,	38	2	40
Ditto 1849,	25	10	36
		SANSCRIT	
December 1848,	14	1	15
Ditto 1849,	14	4	17

This result was considered very satisfactory as the paying system had been in full operation for the whole of the year, and had acted favorably in raising the social standard of the Students, while at the same time it appeared to have had no bad effect on their numbers. The total amount of fees collected during 1849 was Rs. 1,004, and at the close of the year there remained 100 paying pupils on the books of the Institution.

6	paying 5 Rs. a month,	30	0	0
1	ditto 3-12 ditto,	3	12	0
4	ditto 3-0 ditto,	12	0	0
9	ditto 1-0 ditto,	9	0	0
1	ditto 0-12 ditto,	0	12	0
79	ditto 0-8 ditto,	39	8	0
		95	0	0

The Committee had however thought it advisable to relax the rule when more than one member of a family attended the College. In such cases, a deduction of 25 per cent. was allowed on the fee of the second child, and of 50 per cent. on that of the third, &c.

Eighty-seven Students had quitted the College during the year, of these five had been transferred to the third Class of the Roorkee College, and ten were known to have found employment.

1. Khuda Buksh, ...Persian Teacher in the Asylum.
2. Ram Lall, ...Writer Civil Engineer's Office.
3. Chunga Mull, ...Writer Collector's Office.
4. Shumbhoo Nath, ...Survey Department.
5. J. Jones, ...Abkaree ditto.
6. Munnoo Lall,.....Commissioner's Office.
7. Kureem Buksh,.....Teacher of Arithmetic Dehlie College.
8. Gopal, ...Accountant Dehlie Bank.
9. Chunnoo Lall, ...Persian Writer Collector's Office,
10. Prem Narain,.....Monitor Dehlie College.

Monthly examinations of the Arabic and Persian Classes had been held by Mufti Mahomed Sudder-ooddeen Khan, who had usually devoted two days in every month to this purpose. His self-imposed duty had been conducted with much care and intelligence, and had been productive of the best results. A similar course had been pursued with the Sanscrit Department, where Pundit Ghasee Ram, formerly a pupil of, but now unconnected with, the Dehlie College, had given valuable assistance both at the Monthly and Annual Examinations.

With the view of encouraging fluency and idiomatic correctness in composition, weekly themes had been set to the more advanced pupils both of the Oriental and English Departments. In the supervision of this branch of their studies, Mr. J. Gubbins and Dr. Ross had given valuable assistance. The Senior English Classes had also been examined in written papers at intervals of three months.

The Drawing Class consisted at the time of the examination of 53 English and 13 Oriental Students. The Surveying Class contained 34 boys, who had been instructed during the year in the use of the Theodolite, keeping a Field Book, &c.

Fifty-seven pupils of the 2nd, 3rd and 4th English Classes, and 47 of those of the Arabic and Persian Department, had studied Nagree during the past year. The text books had been the Neetkatha, Raj Mitter, and History of England in Nagree.

The annexed statement shows the number of pupils, in both Departments who had pursued the branches of study therein mentioned.

	Oriental.	English.
Trigonometry, ...	13	23
Geometry,..	28	62
Dynamics,..	1	2
Statics,....	8	4
Introduction to Natural Philosophy, ...	12	41
Geography, ...	16	88
Integral Calculus,..	1	2
Differential ditto,..	8	4
History of England, ...	18	42
Conic Sections,....	7	8
History of India,..	14	21
Analytical Geometry, ...	9	6

ENGLISH DEPARTMENT.

The questions in History, Literature, and Mathematics, proposed to the first English Class at the annual examination, were forwarded by the Government. Those on the other subjects of study were prepared on the spot. The four Senior Classes of this Department were examined in written papers, the Juniors orally. Specimens of the answers of the more advanced pupils of this Department will be found in the Appendix.

ARABIC DEPARTMENT.

The two Senior Arabic Classes gave in written papers upon all the subjects studied by them. Their answers were inspected by the two Senior Moulvees, and by Mufti Mohumed Sudderooddeen Khan, who pronounced their progress to have been highly satisfactory.

PERSIAN DEPARTMENT.

The first and second Persian Classes were examined in the works mentioned in the margin.* Their papers were examined by Mohumed Sudderooddeen Khan, and two of the Masters of the College, and the numbers assigned to them bore testimony to the general proficiency of the Students.

Abool Fazil,
Hoosn-i-ishk,
Nulduman,
Sekunder Namah,
Shurbfatch,
Qusayed Unwuree.

The Shea Class consisting of four divisions, the first of which contained but two pupils, was examined by the Senior Arabic Moulvees with the aid of the Mufti.

SANSCRIT DEPARTMENT.

Of the 17 pupils in this Department, 11 gave in written answers. This was a marked improvement on the preceding year, when out of 15, only one was able to do the same.

Questions in the Siddhant Kaumudi, Sahotya Durpun, Hanuman Natak and Munorama had been forwarded by Dr. Ballantyne from Benares; but the last named work had not been studied by the pupils, and the paper upon it was consequently not issued. The first portion of the questions were however creditably answered, as was also a set of papers prepared by Pundit Ghasee Ram on the Mitakshara, Kungaprukash and Munoosanhita. In his replies to these Gungobullub, a native of Kotah, who had lately joined the College, particularly distinguished himself.

ESSAY.

Mr. J. Gubbins had proposed as the subject of the annual Essay. —"The difference in the liberty of the subject under Mahomedan and British rule." Some of the papers sent in displayed a fair amount of historical and general knowledge, and much freedom from national prejudices. Motee Lall's Essay in English and Mohumed Hoossein's in Oordoo, were considered the best of their several kinds.* Motee Lall was also successful in his competition for the silver medal, which *Sir* Theophilus Metcalfe had offered as a prize for the best English Essay on the History of British India.

Shortly before the examination, Mufti Mohumed Sudderooddeen Khan had offered a medal for the best Oordoo theme on the following subject "How to promote health in this world and happiness in the next." More than twenty pupils of the English and Oriental Departments competed for the prize which was awarded by the Mufti to Mohumed Hashem of the first Arabic Class. Lieutenant M. Elphinstone, of the 4th Native Infantry, also offered to place at the disposal

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* NOTE.—The gold medal offered by *Sir* Herbert Maddock as a prize for the best Essay in the Vernacular of the North Western Provinces, was also won by Motee Lall.

The subject proposed by Government was—"On the different liberal professions and useful occupations open to the Natives of India, and the best mode of succeeding in each, whether as regards preliminary training, or subsequent exertions." The competition was open to all the Colleges, and Essays were sent in by seven candidates.

Motee Lall, whose Essay will be found in the Appendix, has since been appointed Persian translator to the Board of Administration at Lahore on a salary of 150 Rupees per mensem.

of the Committee a Scholarship of 3 Rs. a month for one year to be conferred on the writer of the best Qaseeda in Arabic. The subject proposed by Mr. Elphinstone was "The Beauties of Spring," and nine pupils of the Arabic Department competed for the prize, which was awarded to Ali Usghur, a Student of the first Class. The subject was issued in the morning, and the verses given in on the afternoon of the same day, yet, notwithstanding the shortness of the notice and the want of previous practice in similar composition, several of the papers were of high merit.

OUT-DOOR SCHOLARSHIPS.

In April last, the Local Committee Public Instruction, had forwarded copies of the scheme of studies for the examination of out-door candidates for Scholarships in the Oriental Department to the Commissioners of Dehlie, Meerut and Bareilly, with the request that they would make their contents known throughout the districts under their charge. At the time of the examination, twenty-five candidates for Persian and Arabic Scholarships presented themselves, nineteen of whom had read all the subjects, an acquaintance with which was requisite to their success. Of these three* were found deserving of, and obtained Scholarships.

* Qayim Ali, Senior Scholar, Persian Class.
Fuzl Ruhman, Junior Scholar, Persian Class.
Oolfut Hoossain, Junior Scholar, Arabic Class.

In the Sanscrit Department, six candidates came forward, none of whom had any knowledge of Geography or Arithmetic, two of the subjects contemplated by the scheme. They however passed a good examination in other respects, and one of them, Gouree Shunkur, displayed so much intelligence and ability, that the Committee, taking into consideration the shortness of the period which had elapsed since the promulgation of the notice, awarded him a Junior Scholarship. The case however was an exceptional one, and the standard will be strictly adhered to in future.

The following is a list of the Scholarships proposed by the Committee and sanctioned by the Government for the year 1850.

List of Senior and Junior Scholars of the Delhi College for the year 1850.

Names.	Amount of Salary.	Total of each Department.	Grand Total.
English Department.			
Senior Scholars.			
Motee Lal, ...	30 0 0		
Radha Kisshun,..	22 0 0		
Mohommed Ishur, ...	15 0 0		
Mukhun Lal	14 0 0		
Mohommed Ali, ...	12 0 0		
Ramjee Dass, ...	10 0 0		
E. Foy,..	9 0 0		
R. Roberts, ...	9 0 0		
Mookund Lal, ...	9 0 0		
Juddoo Nath, ...	9 0 0		
Bhugwan Dass, ...	9 0 0		
		118 0 0	
Junior Scholars.			
Nund Kishore,..	7 0 0		
Ameer Ali, ...	6 0 0		
Bisshun Nath, ...	6 0 0		
Choonuee, ...	6 0 0		
Dwarka Nath, ...	6 0 0		
Munohur Lal, ...	6 0 0		
Raja Lal, ...	6 0 0		
Rujun Lal, ...	6 0 0		
Gungapershad, ...	5 0 0		
Jowahir Lal, ...	5 0 0		
Juggun,..	5 0 0		
Peyara Lal, ...	5 0 0		
Sut Cowri, ...	5 0 0		
Doorgapershad, ...	5 0 0		
Illahee Buksh, ...	4 0 0		
Kalee Narain, ...	4 0 0		
Nahur Sing, ...	4 0 0		
Teekum Lal, ...	4 0 0		
Budree,...	4 0 0		
Purmeshree, ...	4 0 0		
Peyaree Mohun, ...	4 0 0		
Bhola Nath, ...	4 0 0		
Becharee Lal, ...	4 0 0		
Buldeo Sing, ...	4 0 0		
Banarsee, ...	4 0 0		
		123 0 0	
Carried over,..		271 0 0	

Names.	Amount of Salary.	Total of each Department	Grand Total.
Brought forward,..		271 0 0	
Jowala Nath, ...	4 0 0		
Ladli, ...	4 0 0		
T. Munud, ...	4 0 0		
Ramsahaye, ...	4 0 0		
Ramjus, ...	4 0 0		
Rugoo Mul.	4 0 0		
Sheopershad, ...	4 0 0		
Goorsahaye, ...	4 0 0		
Kisshun, ...	4 0 0		
Sheo Narain, ...	4 0 0		
Noor Mohommed, ...	4 0 0		
Sheopershad, ...	4 0 0		
Surroop Narain, ...	4 0 0		
Sree Nauth, ...	4 0 0		
Pran Kisshun, ...	4 0 0		
Ram Surroop, ...	4 0 0		
Amur Nath, ...	4 0 0		
		68 0 0	
Oriental Department.			
Arabic Senior Scholars.			
Khaja Zeeaooddeen, ...	10 0 0		
Mohammed Hashim, ...	10 0 0		
Mohammed Ali, ...	10 0 0		
Zeeaooddeen, ...	10 0 0		
Tuqa Oollah, ...	9 0 0		
Mohammed Hoosain, ...	9 0 0		
Serdar Beg, ...	9 0 0		
Seerajooddeen,..	9 0 0		
Nazeer Ahmud, ...	8 0 0		
Ali Ahmud, ...	8 0 0		
Mohammed Qasim, ...	8 0 0		
Tufuzzool Hoosein, ...	8 0 0		
Sheikh Ahmud, ...	6 0 0		
Abdool Hafiz, ...	6 0 0		
Rahim Buksh, ...	5 0 0		
Moheeooddeen, ...	5 0 0		
Noorul Hussun, ...	5 0 0		
Abdool Azeez, ...	5 0 0		
Gholam Qoodsee, ...	5 0 0		
Mohammed Ameen, ...	5 0 0		
Abdoollah, ...	5 0 0		
Hoosain Buksh, ...	5 0 0		
Ali Nuqee, ...	5 0 0		
Mohommed Mirza, ...	5 0 0		
		170 0 0	
Carried over,..		509 0 0	

Names.	Amount of Salary.	Total of each Department.	Grand Total.
Brought forward,..		509 0 0	
Alumdar Hoossein, ...	5 0 0		
Mohammed Mooneer,..	4 0 0		
Mohammed Sahir, ...	4 0 0		
Khaja Buksh, ...	4 0 0		
Abdool Ruzak, ...	4 0 0		
Luteef Hoossein, ...	4 0 0		
Mohunlal, ...	4 0 0		
Aizaz Hoossein, ...	4 0 0		
Imdad Ali, ...	4 0 0		
Sadiq Ali, ...	4 0 0		
Oolfut Hoossein, ...	4 0 0		
Persian Senior Scholars.		45 0 0	
Zukaoollah,.	10 0 0		
Dhurneedhur, ...	9 0 0		
Kidar Nath, ...	9 0 0		
Kazum Ali, ...	9 0 0		
Junior Scholars.		37 0 0	
Bubur Ali, ...	6 0 0		
Sekundur Ali, ...	6 0 0		
Dilshun Khan,..	5 0 0		
Mohammed Beg, ...	5 0 0		
Agha Ali, ...	4 0 0		
Abdool Ruzzaq, ...	4 0 0		
Gholam Hydur, ...	4 0 0		
Qasim Ali, ...	4 0 0		
Ali Hussun, ...	4 0 0		
Nujmooddeen, ...	4 0 0		
Fuzloor Rahman, ...	4 0 0		
		50 0 0	
Sanscrit Department.			
Senior Scholars.			
Gunga Bullub,..	10 0 0		
Balmookund, ...	9 0 0		
Junior Scholars.		19 0 0	
Ramsookh, ...	4 0 0		
Golab, ...	4 0 0		
Khoshee Ram,..	4 0 0		
Mithun, ...	4 0 0		
Purs Ram, ...	4 0 0		
Hurna, ...	4 0 0		
Manohur, ...	4 0 0		
Meeda, ...	4 0 0		
Gowree Shunker, ...	4 0 0		
		36 0 0	
Grand Total Company's Rupees, ...			696 0 0

Several of the more advanced Students had during the past year been attending the Civil Courts with the view of familiarizing themselves with the forms of official business. The Officiating Principal, in noticing this, remarked that from the press of competition it not unfrequently happened, that youths whose qualifications were undoubted, remained long after quitting the College, without any provision. He therefore proposed that any *eléve* of the College, who could procure a certificate of his fitness for official employment from the officer whose Court he had been attending, should at once be appointed a supernumerary on a small salary, till such time as a vacancy might occur.

To this proposal the Lieutenant Governor expressed himself unable to accede. If the education bestowed upon the Students was of that practical and useful kind, which it had been the aim of the Government to secure, there could be no doubt that the Civil Officers would gladly avail themselves of the services of men of more cultivated and better exercised minds than the common run of candidates for employment. The advantages afforded by a liberal education were so great, that if they did not tell in the long run, it must be the fault of their possessors; and any extraneous aid at the commencement of their career would be rather injurious, than beneficial, by teaching them to rely more on others and less on their own exertions for the advancement of their position in life. There might however be exceptions to this general rule, and in cases, where a Student of good character and promise was likely to be distressed for the means of subsistence while qualifying himself for public employ, there appeared no objection to his being presented on leaving the College, with such a sum as might suffice for his present necessities. The donation however should on no account exceed a moderate provision for a single year.

On the 24th July 1849 the sanction of Government was obtained to the appointment of Kureem Buksh, Senior scholar of the Arabic Class as Arithmetician in the Oriental Department. The vacancy was consequent on the death of Moonshee Faiz Parsa. Sanction was at the same time given to an increase of Rs. 50, to the salary of Mr. Goulding, the Drawing Master.

On the 31st July, the Government subscribed for 55 copies of a new edition of the "Laghu Kamudi," with a Hindi version, commentary and references by Dr. Ballantyne. The copies taken were distributed among the Colleges and Schools in these provinces.

On the 19th November 1849, the Government subscribed for 24 copies of the two following works, viz. "Turzkirut-ool-kamileen" and "Sureeh-ool-felun," compiled by Ram Chunder the teacher of European Science in the Dehlie College.

In January 1850 the Local Committee recommended, and Government sanctioned, the continuance of the Scholarships of Radha Kishen and Motee Lall, Students of the first English Class, for a third and fourth year respectively, Motee Lall was stated to have deserved this peculiar mark of favor by the success with which he had prosecuted his English studies, and the useful manner in which he had employed his leisure hours in preparing translations and in editing Oordoo periodicals.

On the 4th February, the Local Committee proposed that in accordance with the request of the teachers of the College, the examination should in future be held in August instead of in December. By this arrangement the annual vacation would fall in September, and those who wished to do so, would have it in their power to leave Dehlie during that unhealthy month. The Committee was informed in reply that it would be inconvenient on several accounts to have the examination of the Dehlie College at a different period from that of the other Institutions, and that no sufficient ground had in the opinion of the Government been assigned for the proposed change.

On the 26th February, Government subscribed for five copies of a new Edition of the traditions of Tirmizee, published by Moulvee Mumlook Ali, 1st Arabic teacher of the Dehlie College; one copy of this valuable work was deposited in the Library of each College.

On the 8th March, the Local Committee forwarded to Government the scheme of Studies for the year 1850, proposed to be followed in the Dehlie College. This will be found in full in the Appendix.

Dr. Sprenger, Principal of the College, rejoined his appointment on the 14th January; ill health however soon compelled him to relinquish his post, and he left Dehlie for Simla on Medical Certificate on the 19th April 1850. On the 20th the Head Master assumed charge of his duties on an additional allowance of 100 rupees per mensem.

BENARES COLLEGE.

58TH YEAR.

Return of the Local Committee, as on the 30th April 1850.

NAMES.	DESIGNATION.
E. A. Reade, Esq., President,	Commissioner.
J. T. Rivaz, Esq., ...	Civil and Sessions Judge.
A. Shank, Esq., ...	Collector and Magistrate.
F. B. Gubbins, Esq., ...	Joint Magistrate.
Major W. Stewart, ...	Agent Governor General.
Doctor D. Butter, ...	Civil Surgeon.
J. G. Gordon, Esq., ...	
Maharajah Ishree Pershad Naram Sing Bahadur, ..	Rajah of Benares.
Rajah Suttyacharan Ghoshall,	
Babu Rajender Mitter, ...	
Babu Rampersun Sing, ...	
J. R. Ballantyne, Esq., LLD.,	Secretary.

(Signed) J. R. BALLANTYNE,

Secy. L. C. P. I.

BENARES COLLEGE :
The 1st May, 1850.

Establishment of the English Department of the Benares College, as on the 30th April 1850.

Names.	Designation.	Amount of Salary.	Date of Appointment.
		R. A. P.	
J. R. Ballantyne, Esq., L.L.D.,	Principal,..	600 0 0	3rd Jany., 1846.
G. Nicholls, Esq.,..	Head Master, ...	400 0 0	1st July, 1834.
D. Tresham, Esq., *(a)*	2nd ditto, ...	200 0 0	1st April, 1847.
Babu Muthrapershad Misir, ..	3rd ditto, (Offg.)	150 0 0	18th ditto, 1847.
Babu Shiva Shankur Sing, ..	4th ditto, ...	100 0 0	18th ditto, 1847.
Babu Kidarnath Palady, ...	5th ditto, ...	50 0 0	18th ditto, 1847.
Babu Situlprashad Gupt, ...	6th ditto, ...	50 0 0	18th ditto, 1847.
Pandit Ramjeshan, ...	Anglo Sanscrit Teacher,	30 0 0	1st March, 1848.
Babu Prankisshun Ghose, ...	Writing Master, ...	20 0 0	11th July, 1848.
Babu Amarnath Mittra, ...	Librarian,..	30 0 0	1st ditto, 1848.
Moulavi Jullalooddin, ...	1st Oordu Teacher,..	50 0 0	1st Nov., 1847.
Moonshi Jaggurnath Doss,....	2nd ditto ditto,....	25 0 0	7th April, 1845.
Pandit Badri Lall, ...	1st Hindi ditto, ...	50 0 0	18th Oct., 1838.
Pandit Lokenath Choubé, ...	2nd ditto ditto,....	25 0 0	1st April, 1847.
	1 Water Bearer,....	5 0 0	
	1 Furash,..	4 0 0	
	2 Peons, @ 4 each,	8 0 0	
	2 Chokeedars, @4ea.	8 0 0	
	1 Duftry,..	5 0 0	
	1 Sweeper, ...	3 0 0	
House rent of Dr. Ballantyne,	Principal,..	50 0 0	
Ditto of Mr. Nicholls,..	Head Master, ...	50 0 0	
Mr. F. E. Hall, ...	Supy. Eng. Teacher,	300 0 0	
Bhugwan Dass, ...	Ditto Hindi ditto, ..	10 0 0	
Moulavi Abdool Ali, ...	Ditto Persian ditto,..	25 0 0	

(Signed) J. R. BALLANTYNE,
Secy. L. C. P. I.

Benares College :
The 1st May, 1850.

(a) Previous service taking from 12th September 1833, when appointed 2nd Teacher in the Allahabad School.

Establishment of the Sanscrit Department of the Benares College, as on the 30th April 1850.

Names.	Designation.	Amount of Salary.	Date of Appointment.
Ishwar Datta, (*a*), ...	Assistant Secretary,	50 0 0	27th Dec., 1842.
Narain Shastree, ...	1st Grammar Teacher,	60 0 0	1st May, 1833.
Deo Datta, (*b*), ...	2nd ditto ditto, ..	32 0 0	1st May, 1833.
Durga Datta, ...	3rd ditto ditto, ..	30 0 0	1st Sept., 1842.
Heeranund Choube,..	Poetry ditto, ..	80 0 0	1st June, 1827.
Oomaram Pundit, ...	Vedanta ditto, ..	80 0 0	1st Feb., 1825.
Kaliprasad Buttacharjya,.. ..	Logic ditto, ..	80 0 0	18th Feb., 1847.
Kashinatha Shastree, ...	Sankhia ditto, ..	80 0 0	1st Jan., 1827.
Gulzar Choube, ...	Law ditto, ..	80 0 0	5th Dec., 1837.
Lujjashunker Pundit, ...	Astronomy ditto, ..	80 0 0	1st Feb., 1825.
Nand Lal Pundit, ...	2nd ditto ditto, ..	32 0 0	1st Feb., 1825.
Bapu Deva Shastree, (*c*), ..	Natural Philosophy,	80 0 0	15th Feb., 1842.
Moulavie Mahomed Ahsan, ..	1 Arabic & Persian do.	82 0 0	1st Jan., 1848.
Munshi Vishasher Prasad, ..	2nd ditto ditto, ..	20 0 0	1st Oct., 1841.
Juddoonath Pundit, ...	Librarian, ...	20 0 0	1st May, 1820.
Kylassnath Chuckerbutty, ..	English Writer, ..	32 0 0	11th July, 1848.
Kanhya Lal, ...	Hindi ditto, ..	8 0 0	15th Jan , 1842.
Harodatt, ...	Duftry, ...	8 0 0	1st Oct., 1829.
Ramjevun, ...	Jemadar, ...	7 0 0	15th Feb., 1820.
	3 Peons @ 4 each, ..	12 0 0	
	2 Furrashes, ...	7 0 0	
	2 Water Bearers, ..	8 0 0	
	2 Bearers, ...	5 0 0	
	1 Sweeper, ...	2 0 0	
	House Rent, ...	25 0 0	
Gopal Bhatta, (*d*), ...	Pensioner, ...	20 0 0	19th Feb., 1829.

Benares College: *The 1st May*, 1850.

(Signed) J. R. BALLANTYNE,
Secretary L. C. P. I.

(*a*) Was Law Professor in this Institution on a salary of 80 Rs. per mensem.
(*b*) Was Student of the College promoted to the Professorship on 16 Rs. a month, (increased 32 Rs. in October 1841.)
(*c*) Was a Teacher of Natural Philosophy in the Sehore School.
(*d*) Was Professor of the Veda at this College.

Statement exhibiting the number of Scholarshipholders and Pay and Free Pupils in the several departments of the Benares College, as on the 30th April 1850.

Sanscrit Department.			Persian Department.			English Department.			Total.			Total of all.
Pay Pupils.	Scholarship holders.	Free Pupils.	Pay Pupils.	Scholarship holders.	Free Pupils.	Pay Pupils.	Scholarship holders.	Free Pupils.	Pay Pupils.	Scholarship holders.	Free Pupils.	
0	18	40	12	8	6	123	10	23	135	36	69	
Total 58			26			156			240			240

Benares College : The 1st May, 1850.

(Signed) J. R. BALLANTYNE, Secy. L. C. P. I.

Statement exhibiting the Number, Caste, &c., of the Pupils in the several departments of the Benares College, as on the 30th April 1850.

Sanscrit Department.			Persian Department.			English Department.			Total.			Total of all.
Hindú.	Mohamedan.	Christian.	Hindú.	Mohamedan.	Christian.	Hindú.	Mohamedan.	Christian.	Hindú.	Mohamedan.	Christian.	
58	0	0	15	11	0	145	5	6	218	16	6	240

Average daily attendance, Sanscrit Department, ... 44
Ditto ditto, Persian ditto, ... 19
Ditto ditto, English ditto, ... 126

Benares College : The 1st May, 1850.

(Signed) J. R. BALLANTYNE, Secy. L. C. P. I.

Statement exhibiting the number of Students studying different languages in the Benares College, as on the 30th April 1850.

Sanscrit.	Persian.	English.	Hindi.	Oordoo.	Remarks.
76(a)	50	176(c)	40	86	

Benares College : The 1st May, 1850.

(Signed) J. R. BALLANTYNE, Secy. L. C. P. I.

(a) 18 belonging to the English Department.
(c) 14 ditto Sanscrit ditto, and
18 ditto Persian ditto.

Statement exhibiting the Number and Names of Students of the several Departments of the Benares College, who have obtained employment from the 1st May 1849 to 30th April 1850.

No.	Names.	Age.	Date of Admission.	Number of the years on the Institution.	Nature of Employment.	Salary.
	ENGLISH DEPARTMENT.					
1	Ooma Churun Biswas, ..	19	28th October 1837,..	12	Writer in the Azimgurh Collector's Office, ...	40 0 0
2	Nobin Chandra Mookarjea,	15	1st April, 1849, ..	2	Writer in the Allahabad Collector's Office, ...	15 0 0
3	Viswanath Bhattacharjea,	17	1st October, 1847,..	4	Writer in the service of Mr. O'Callaghan, ...	10 0 0
4	Gooroodass Mukarjia, ..	16	1st January, 1848,	3	Writer in the Magistrate's Office, Allahabad, ..	15 0 0
5	Vishun Dutt, ...	17	24th June, 1842, ..	9	Writer in the Post Office, Benares, ...	15 0 0
	PERSIAN DEPARTMENT.					
1	Mohumed Afzal, ...	18	12th September, 1849,	3	Oordoo Teacher to a European,	15 0 0
2	Fida Hossain, ...	22	5th April, 1845, ..	5	Mohurrir in the Thana of Adampora, ...	7 0 0

BENARES COLLEGE :
The 1st May, 1850.

(Signed) J. R. BALLANTYNE,
Secy. L. C. P. I.

Statement of the Receipts and Disbursements of the Benares College during the official year 1849-50.

Resources of Annual Income.

Separate Fund.				As signment from Parliamentary Grant.	Total.*	As signment from Additional grant.	Establishment fixed by Government.	Tuition Fees.	Grand total of Receipts.
A separate grant from Govt. Rs. 20,000, ₹ annum or Co.'s Rs. 1701-1-9 ₹ mensem.	20413	5	0						
Interest of Co.'s Papers belonging to the College amounting to Sicca Rs. 1,33,000 @ 472-14-2 ₹ mensem,	5674	10	0						
	26087	15	0	0 0 0	26087 15 8	16308 0 4	42396 0 0	1182 0 0	47092 5 3
* *Exclusive of the following items.*									
Balance of last year,....	10	10	4						
Book allowance, ...	0	0	0						
Apparatus Grant, ...	0	0	0						
Prize allowance for both Depts.,	150	0	0						
By subscription in the Station,..	285	0	0						
Fines realized,..	0	0	0						
Books sold, ...	142	9	6						
Medal allowance from Govt., ..	0	0	0						
Admission Fees,..	0	0	0						
Tuition Fees,..	1182	0	0						
Postage from Government, ...	33	3	6						
Ghoshal Scholarships, ...	200	0	0						
	2003	7	4						
Grant for the purchase of Sanscrit Manuscripts,	500	0	0						
				2503 7 4					
Expended for Books, Stationery, Scholarships,	1913	15	7						
Ditto by purchase of Sanscrit Manuscripts,	355	8	6						
				2269 8 1					
Balance in this date,....	89	8	1						
Ditto on account of Sanscrit Manuscripts,	144	7	2						
				233 15 3					

Actual Charges during the year.

Nature of Charges.	Items.			Charges.		
Principal, ...	7200	0	0			
English Teachers, ...	12260	0	0			
Vernacular ditto, ...	11592	0	0			
Deputy Secretary, (Sanst.),..	600	0	0			
Establishment of both Departments.	2562	0	0			
English Scholarships, ...	1090	0	0			
Sanscrit ditto, ...	2116	0	0			
Persian ditto, ...	732	0	0			
Prizes for both Departments,	150	0	0			
House rent of Principal, Head Master and one Supry. English Teacher,	1425	0	0			
Ditto for both the Colleges,..	382	0	0			
Pension (Sanst.),..	240	0	0			
Postage for Government purposes,	33	3	6			
Medal allowance, ...	0	0	0			
				40382	3	6
Village School superintendence,	1116	0	0			
Supernumerary Masters, ..	3284	8	3			
				4400	8	3
Grand Total, ..				44782	11	9

Benares College:
The 1st May, 1850.

(Signed) J. R. BALLANTYNE,
Secy. L. C. P. I.

The annual examination was commenced on the 19th November, and completed by the 6th December 1849.

At this period the names of 211 boys were upon the lists of the College, which had thus remained so far as numbers went, in *statu quo*. The Students were distributed as follows :—

Department.	*Scholars.*	*Free Students.*	*Paying Students.*	TOTAL.
Sanscrit, ...	6	40	0	46
Anglo-Sanscrit,..	12	1	0	13
Arabic and Persian, ...	7	6	10	23
English, ...	9	16	104	129
Total, ...	34	63	114	211

Some trouble had been experienced in collecting the tuition fees, but the system had worked well, and it was proposed to demand a fee on admission, in addition to the regular monthly payment.

ENGLISH DEPARTMENT.

The examination of this Department was conducted by the Principal and Head Master, with occasional assistance from Dr. Butter and Mr. Rivaz. The senior division was examined in written papers, the junior orally. All the boys had, in addition to their English reading, devoted some part of their time to Oriental studies, more especially to Hindi.

SENIOR DIVISION.

Ooma Churn Biswas, one of the four Students, who had composed the Senior Class at the commencement of the Session, had during the year obtained employment under the Magistrate of Azimgurh; Bachar Lall, another pupil, had been permitted to retain his Scholarship, while qualifying himself for entrance into the Roorkee College: a condition, which it was feared, he was not prepared to fulfil. The two remaining members of the Class were spoken of in very high terms by Dr. Ballantyne. Besides their regular studies they had read for their own improvement during the year, Sallust, several of Cicero's Orations, and the first book of the Æneid, in Latin; a book of Xenophon, the Odes of Anacreon, and part of the Iliad in Greek; Whewell's Morality, Herschell's Discourse, Mill's Analysis, Combe's Physiology, and portions of Ritchie's Calculus, and Peschell's Physics, &c. The judicious questions which they had been in the habit of bring-

ing to the Principal for solution were the best proof, that their reading had not been superficial, but careful and well digested. Both these Students proposed to devote their attention during the present year to the study of Law, with the view of competing for a Moonsiffship at its close. The second division of the Senior Class contained but four members, of whom Chundra Nath Mittra acquitted himself the best.

In the second and third Classes of this division were comprised 30 boys. Their attendance and progress during the past year had been good, though some of them had shewn a want of taste for their Mathematical studies. Gunesh Chowbé and Ramchunder Chuckerbutty were the most forward among them.

JUNIOR DIVISION.

The 24 boys composing the first Class were examined by Dr. Ballantyne, with the assistance of Dr. Butter and Mr. Rivaz, who reported as follows :—

"The Class was examined by me in English History. Many of "the boys shewed a very creditable acquaintance with what they had "read; especially Keilasnath Sukool, who answered very satisfac-"torily."

"The pronunciation of English is pretty good ;—no general fault "runs through the Class, and it hence appears that all defects might "be got rid of by attention. It appears however that they read some-"what much for their powers of understanding."

"In Oordoo there is still room for improvement, but on the "whole the reading is better than it was last year. The Moulvi Jellal-"ood-deen employs an hour every week in teaching Persian; and in "explaining the most frequently recurring forms of Arabic deriva-"tions. The benefit of this practice is apparent."

The progress of the second Class of this division, under Babu Muthra Pershad Misr, was unfavorably reported on by Dr. Butter.

"I have examined this Class in Reading and Explanation. The "reading I consider very imperfect. The pronunciation of the vowel-"sounds has been little attended to. Pause and emphasis have also been "much neglected. I would suggest that the teacher of this Class "mark in a copy of the text book the primarily and secondarily "accented words in each sentence. All other means of attaining "improvement have apparently failed. I cannot say that the explan-"ation given by the boys of the very simple text book was satis-"factory."

The third and fourth Classes, comprising 14 and 39 boys respectively, had made good progress, with the exception of the Class under Babu Setul Pershad Gupt, who had shewn himself a careless and indolent teacher.

ARABIC AND PERSIAN DEPARTMENT.

The number of pupils in these Classes had increased to 23, of whom seven were Scholarshipholders, and six free pupils. More attention and improvement had been observed during the past year than was formerly the case; and though its numbers were low, the department was on the whole considered to be in a satisfactory state.

SANSCRIT DEPARTMENT.

So full a description of the nature of the examination of this branch of the College was given in the printed report of 1848-49,—that it is now sufficient to state that the papers of this year reflected credit both on the teachers and the taught. The following extracts from Dr. Ballantyne's report will however be found interesting.

Extract from Dr. Ballantyne's Remarks, on the Logic Class in the Sanscrit Department.

"Among the advantages that may eventually attend the estab-
"lishment of this Class, we may look for the means of removing those
"discrepancies of opinion which at present exist in Europe with regard
"to the Logic of India. The Logic of India has not yet been exhi-
"bited to the learned of Europe in a way that does it justice. The
"differences of opinion in Europe on the subject suffice to show that
"further enquiry is necessary, and how valuable an auxiliary in regard
"to such an enquiry a Class of Pundits thoroughly well versed in
"European logic as well as in their own, would prove, it would be
"superfluous to argue. One subject of discussion in the Class, for
"example, was furnished by a paper of enquiries sent from Scotland
"by one of the most celebrated metaphysicians of the day, who found
"himself at a loss in regard to certain points in the logic of India,
"which Colonel Vans Kennedy, represented differently from Mr.
"Colebrooke. His rejoinder to the reply sent to him may be expected
"to furnish additional subjects of interesting discussion in the Class.
"And is it too much to expect that an occasional interchange of
"opinions such as the present—whether the occasion be invited or
"only welcomed when it offers—with philosophical enquirers beyond
"the Ocean, should have something of an expansive influence on the
"minds of our Pundits, too much disposed, as they are, to think that
"all philosophy is a monopoly of their own—a product indigenous to
"India alone?"

Class of Mathematics and Natural Philosophy.

"In the European course of Mathematics the progress of several "of the Students has been gratifying. They have gone through the "Spherical Geometry and Conic Sections in Chambers' Course, and "have commenced Spherical Trigonometry. In the Calculus they "have gone through the two first parts of Ritchie's Treatise."

"The instructions given by Pundit Bapu Deva having been pre-"viously, from want of books, confined almost exclusively to pure "Mathematics and Astronomy, I endeavoured to supply in my "Sanscrit Lectures, on the subjects of Mechanics, Optics, &c., what "might serve as a first text-book of Natural Philosophy. His treatise "(which owes to the Pundit himself whatever may be found commend-"able in the Sanscrit rendering) has been employed in the Class "during the past year; and several of the Students, to whom expe-"rimental illustrations have from time to time been exhibited, have "passed a satisfactory examination in it. An abstract of some of the "leading chapters in Sir John Herschell's Discourse on the Inductive "Philosophy, forms another text-book of the Pundit's lectures. It is "intended that these brief treatises shall be gradually expanded into "more complete works."

Proposed new studies in the Junior Department of the Sanscrit College.

"Some of the younger boys in the Sanscrit Department have "made excellent progress in Grammar, which they study to the exclu-"sion of every thing. The case of these boys is rather difficult to "deal with satisfactorily. In accordance with the views laid down in "my previous reports, and sanctioned by your Committee and the "Government, I regard the Sanscrit College in no other light than as "a nursery of Pundits, who can prove valuable auxiliaries of Govern-"ment, in the general diffusion of correct knowledge throughout the "country, only if they possess two requisites—the one being an "acquaintance with the correct knowledge in question, and the other, "such a knowledge of Sanscrit, as may enable them to command "a respectful hearing from their fellow countrymen, learned or "unlearned."

"The question that next occurs, has reference to the order, simul-"taneous or successive, in which these two requisites are to be "attained. Judging by the attainments in Sanscrit of those pupils in "the College who have attempted to carry on the study of English and "of Sanscrit together from the first, I am inclined to doubt whether "any boy who adopts this plan will ever be able to pass muster among "the Pundits as a first rate Sanscrit scholar; and I would therefore "recommend that no Student who aims at becoming, and who

"gives promise of becoming a proficient in Sanscrit, should be urged "or even encouraged, to grapple with the English also, until he shall "have been thoroughly well grounded in the Sanscrit Grammar, for "which he will be otherwise almost certain to acquire a distaste. This "appears to have been the case with two of the best pupils ever "raised in the College (and now employed in it as teachers) who "seem to have again and again attacked the Sanscrit Grammar, and "to have each time relinquished it in despair and disgust."

"Whilst then I would not recommend a young Sanscrit Student "to commence English until after some years' study of the Sanscrit, "when he will be able to study the English Grammar methodically "in the pages of a Sanscrit treatise on the subject, yet I feel strongly "that the bare dry study of words, and the formation of words,— "with no reference to things—during a long period of early youth, "can furnish but a meagre nutriment for the mind, and a one-sided "training for its faculties. The best way to obviate this, as it seems "to me, would be to take effective measures for the encouragement "of the study of such subjects as Geography, History, &c. through "the medium of the Vernacular."

"That such a plan has never hitherto succeeded has probably "been owing to the want of interesting and accurate works for perusal, "and to the prevalent feeling (embodied in the remonstrance of the "Students—'this is a *Sanscrit*, not a Hindee College') that the cultiva- "tion of the Vernacular is beneath the dignity of a Sanscrit Student; "and it is to meet the former of these objections that I now propose "to prepare in the first instance a considerable modified version in "Hindee of my course of Sanscrit lectures 'on the circle of the "Sciences'; omitting some, and expanding and simplifying other por- "tions. This series of tracts I propose to bring out in small portions, "each complete *per se*, so that the issue of the series may be stopped "at any point if it be found unserviceable."

"With regard to the prevalent objection, in the Sanscrit College, "to the study of the Vernacular, I would earnestly recommend that "the steps taken with a view to obviate it should be in the way of "allurement rather than of compulsion—at all events at the commence- "ment. A stipend of two rupees per month might reconcile some ten "or fifteen promising young boys, of from 9 to 14 years of age, to this "additional branch of study, and without some such allurement, I "should not entertain any great hopes of success under the circum- "stances. The approval of the elder Pundits is not to be looked for— "even could we reckon on their neutrality: and it should not be "forgotten that a mere Sanscrit education, unencumbered by the con- "dition of learning any thing else,—can be at any time obtained by the "young Brahman from the Pundits of the city, who teach for nothing "even when they do not contribute to the support of their pupils,—

"the funds for such a purpose coming in the first instance from rich "natives, who make a merit of aiding in so meritorious a work."

"Pundits Badri Lall and Ramjeshan would take charge of "teaching this Hindi Class, which, were it established and properly "looked after, might be expected to supply valuable recruits to the "English Class of Pundits."

On the English Class of Pundits.

"I have felt quite satisfied with the earnest diligence, and with "the progress of several of the young Pundits who are studying "English; and I feel tolerably confident that in the minds of the "most intelligent amongst them there has now arisen a spirit of "enlightened enquiry, which will neither suffer itself to be readily "discouraged nor to be lulled into torpid slumber."

"The assignment of a separate teacher to this Class has enabled "a considerable deal of ground to be gone over, as the tabular returns "will show. The Pundit *Ramjeshan* has been assiduously attentive "to his duties. Some of the more advanced pupils have enjoyed the "advantage of reading the History of Greece, and Pope's Homer, "with Mr. Fowles, with whose instructions they profess themselves "much pleased. Mr. Nicholls, at my request, conducted the oral "examination of the Class. His report on it will be found in his "official letter. One result of this examination, I am glad to find, "is a desire on the part of Mr. Nicholls to take a share in the tuition "of the Class next year."

"With the Senior pupils of this Class I have read during the "last year portions of the works of Bacon and Shakespeare: among "the papers given in at this examination are some clever renderings of "Shakespeare into Sanscrit verse. For a Pundit who is just beginning "to study English it is not easy to find a suitable book. The little "stories, &c., of which English Juvenile School books are usually made "up, are not calculated to interest him; and, from their containing "conversational idioms, they are frequently more difficult to parse, "and to render a strict grammatical account of, than a scientific "disquisition might prove. Such Class-books are by no means calcu-"lated to excite or gratify the curiosity of a Student of tolerably matured "faculties:—and if the attempt to render the study of English accept-"able to Sanscrit scholars elsewhere has been found to fail, one of the "causes of failure may, with tolerable security, be charged upon the "character of the Class-books employed. These considerations led "me to select the Novum Organon as a Class-book for this Class "of Pundits so soon as they had gone through the elements of Eng-"lish Grammar; and the result, in a great measure, answered my "expectations; for the weighty and solid character of the matter

"served to occupy the mental digestive power of the reader, to call "his powers of judgment into exercise, and thus to keep up his inter-"est in the subject during the repeated examination and analysis to "which each passage was subjected for grammatical purposes. Still "the style of the English translation of the work might be advan-"tageously altered for the purpose here in view; and with the design of "supplying a suitable and not expensive Class-book for Classes of this "kind, I propose to make a selection from the aphorisms of the "Organon; to render these—not unidiomatically—but as nearly as "possible on the model of the plainest Sanscrit, to which the Latin "original comes nearer than perhaps any existing English translation, "and to intersperse amongst them illustrative remarks so as to combine "the selected aphorisms into an abstract, which, constructed on the "plan proposed might serve as a convenient introduction to the study "of the entire work."

The following is a list of the Scholarships in the several Departments, proposed by the Committee and sanctioned by Government for 1850. In the allotment of those for the Anglo-Sanscrit Students, Doctor Ballantyne stated that the acquirements of the pupils, in Sanscrit, as well as in English had been taken into account; as, when the object was to encourage the study of English on the part of those whose Sanscrit learning gave them weight in the native community, it would have been impolitic to dishearten a learned Pundit by assigning to him a lower stipend than had been given to an inferior Scholar, whose only merit was a longer acquaintance with English. The Principal's views on this point were approved of by the Government.

List of Scholarships in the Benares College for 1850.

Names.	Amount of Scholarships.	Grand Total.
English.		
Senior.		
Gobind Chunder Sundel, ...	20	
Ram Rai Choudhree, ...	20	
Junior.		40 0 0
Chunder Nath Mitter, ...	10	
Kashipershad Chstirjee, ...	10	
Ram Chunder Sen, ...	10	
Gunesh Choubé, ...	8	
Setanath Mitter, ...	6	
Grish Chunder Sandel, ...	6	
Ghoshall Scholarship.		
Bereshwar Battacharj, ...	8	
Ilahi Buksh, ...	5	
Arabic Senior.		63 0 0
Muhamud Moosa, ...	16	
Junior.		16 0 0
Baijnath Pershad, ...	8	
Senior Persian.		8 0 0
Gunga Pershad, ...	8	
Mohinder Narain, ...	8	
Bechoo Sing, ...	8	
Junior Persian,		24 0 0
Krishna Chandra, ...	7	
Mohun Lall, ...	6	
Shri Nandan Sing, ...	6	
Sanscrit.		19 0 0
Senior.		
Setul Pershad Tiwaree, ...	16	
Jara Dutt Jotshi, ...	14	
Suvans Choubé, ...	10	
Vacant, ...	11	
Ditto, ...	10	
Junior.		61 0 0
Syama Tiwaree, ...	7	
Ramdin Purohit, ...	7	
Narain Dutt Punth, ...	7	
Vacant, ...	7	
Ditto, ...	6	
Anglo-Sanscrit.		34 0 0
Balkrishna, ...	16	
Bechan Tiwaree, ...	16	
Ram Narain, ...	15	
Vunkut Ram, ...	14	
Jagarnath Pande, ...	10	
Gobind Deva, ...	10	
Brij Bhoosun,..	5	
Jhakur Dutta,..	4	
Deva Dutta, ...	4	
Jagarnath Sookul, ...	15	
Vitthul Shashtree, ...	6	
Vishun Dutta, ...		130 0 0
	Total Rs., ..	395 0 0

In his report, the Principal observed that much difficulty was found even by his best pupils, in their search for employment after quitting the College. He therefore proposed that the passing of an examination of some fixed and high standard, should entitle the successful Student to immediate employment under Government on a salary of Rupees 30 or thereabouts; should no vacancy exist at the moment, the passed Candidate might be directed to prosecute his studies at the College, and to employ himself, under the direction of the Committee in the preparation of translations and treatises in the Vernacular. A Class, like that of the fellows of our English Colleges, would thus be formed, the members of which might be drafted off, as their services were required, into the Educational or other Departments.

This proposition did not however meet with the full support of the Members of the Local Committee. Mr. Reade, while acknowledging that the difficulty did exist, remarked as follows:—

"I do not think that it is attributable to any reluctance on the "part of heads of Departments to employ them, that so few of the "pupils of the College have hitherto attained office. It is rather "owing to there being no system of introduction, to the reluctance of "many of the Students to leave Benares, and to the assumption of not "a few, that a Collegiate education entitles them of right and '*per* "*saltum*' to admission to high office. As regards the two last "of these impediments the remedy is with the Students themselves. "I shall be happy to make this office contribute, in some mea-"sure to the removal of the first by opening a book of registry "of names, qualifications and recommendation of deserving pupils, "and transmitting transcripts of the entries to the several Magis-"trates and Collectors in the division. It will however clearly "be understood that this is merely a preliminary, and that any "after-nomination will rest with the Local authority."

In reply to the letter of the Local Committee the Lieutenant Governor expressed his satisfaction with the success attending Dr. Ballantyne's system. The remarks on the Class of Anglo-Sanscrit Students had been read with peculiar interest; and with the view of providing a nursery, whence future vacancies among them might be supplied, the Principal was authorized to grant small stipends of two rupees a month to such of the more promising boys of the Junior Sanscrit Department, as were willing to devote part of their time to the acquirement of European knowledge, through the medium of Hindee. With regard to the proposition mentioned above, it was observed that the difficulties experienced by the Students of the Benares College in their search after employment, were not found to exist at all in the Agra Institution, where it was rather the complaint

that the head Scholars were drafted off too rapidly to admit of keeping up the standard of the Classes. It might not unreasonably be concluded that the fault, where the results were so dissimilar, rested with the Students themselves who were too apt to consider themselves entitled to high employment at once, forgetting that a superior education, however valuable it might ultimately prove, could not enable them to conduct the duties of any important post, without that acquaintance with the forms of official business which must first be acquired in a subordinate position.

Kali Prasad Bhuttacharjeea, the officiating Nyaya Pundit, had been promised that on the fulfilment of certain conditions he should be raised to the permanent appointment. On the report of the Local Committee that he had fulfilled his part of the contract, sanction was granted to his drawing the full salary of his office, Rs. 80 per mensem, from 1st January, 1850. The salary of Pundit Ramjeshan, late a Master of the Ghazeepore School, was at the same time raised to Rupees 30.

In May 1849, in reply to an application made by him, the Secretary Benares School Book Society was informed that the Lieutenant Governor "was prepared to grant similar assistance to this as to the "Dehlie Translation Society, by the purchase, at the Society's prices, of "a certain number of each approved work, for distribution among the "Government Educational Institutions." In accordance with this declaration, several copies of an "Outline of Metaphysics" and on "Elements of Sanscrit Grammar in the Hindi" were taken and distributed. Copies of Dr. Ballantyne's "Lectures on the Nyaya Philosophy" were forwarded to the Governments of Bengal, Madras, and Bombay, and the remainder of the edition divided among the Colleges and Schools in these provinces.

In compliance with a request of Dr. Ballantyne, a letter was addressed by the Government to the Secretary Government of Bombay, requesting him to forward to Benares 20 copies of Major Candy's English and Mahratta Dictionary. The work had been lately printed for the Bombay Colleges, and was calculated to be of much use to such of the young Pundits, who had recently been induced to study English, as were of Mahrattese parentage.

On the 29th December, 1849, in accordance with the request of the Local Committee, the Lieutenant Governor was pleased to appoint Major W. M. Stewart a Member of the Committee in the room of Major McGregor, C. B.

During the course of the year bills were passed for the printing of 500 Copies of the II., III., and IV. parts of Dr. Ballantyne's Lectures in English and Sanscrit on the Relations of Knowledge.

On the 5th of February 1850 a letter was received from Secretary Local Committee, reporting the death of Mr. H. D. Fowles, formerly Head Master of the Ghazeepore School, and lately a Supernumerary teacher in the Benares College.

On the 25th February, M. F. Edward Hall, an M. A. of the University of Cambridge in the United States of America, was appointed a Supernumerary teacher in the Benares College, on a salary of Rs. 300 per mensem. This gentleman had been strongly recommended by the Local Committee as well calculated to be an able coadjutor to Dr. Ballantyne in conducting that scheme of study with which the Government had already expressed so much satisfaction. Mr. Hall entered on his appointment on the 15th March.

Mr. F. B. Gubbins was appointed a Member of the Committee in the room of Mr. St. George Tucker, who had left the Station.

ROORKEE COLLEGE.

3rd Year.

Statement of authorized Salaries and Establishment of the Roorkee College on 1st May 1850.

No.	*Description of Service.*	*Salary.*	*Name of Incumbent.*	*Date of Appointment.*
1	Principal, ...	600 0 0	R. Maclagan, Lieutenant, Engineers,	October 19th, 1847.
2	Head Master, ...	300 0 0	Mr. H. Bingham, Conductor Sappers and Pioneers,	January 24th, 1848.
3	Architectural Drawing Master, ..	200 0 0	Mr. W. Scotland, ...	June 8th, 1848.
4	1st Native Teacher,.....	120 0 0	Munnoo Lall, ...	March 1st, 1849.
5	2nd ditto ditto, ...	50 0 0	Beharee Lall, ...	January 10th, 1848.
6	Eight Stipendiary Students, 1st Department,	320 0 0		
7	Sixteen do. do. 2nd Department,	80 0 0		
8	Establishment, &c., ...	169 0 0		
	Total authorized Expenditure,	1839 0 0		

Tabulated Statement of Students now at the Roorkee College, or who have passed through it since the date of the last Report.

FIRST DEPARTMENT.

CANDIDATES FOR APPOINTMENT OF SUB-ASSISTANT EXECUTIVE ENGINEERS.

Number of Stipendiary Students—8.

Number.	*Names.*	*From what Place.*	*Date of*		*Remarks.*
			Admission.	*Leaving.*	
1	Ameer Khan,	Dehlie College,	March 12th, 1848.		
2	Hurce Churn,	Agra ditto,	July 12th, 1849.		
3	J. F. Platts,	Bedford, ...	Nov. 26th, 1849.		
4	Kunhya Lal,	Agra College,	Not joined.		
	4 Vacancies,				

The total number of examined applicants for admission to this Department has been 10.

SECOND DEPARTMENT.

European Non-Commissioned Officers and Soldiers, in training for the duties of Assistant Overseers in the Department of Public Works.

Number of Students—15.

Of the first four Students of this Department, notice was taken in the last Report. The fifth, Serjeant C. Leslie, Sappers and Pioneers, after a long continuance of bad health, died on 7th January 1849.

Number.	Names.	Rank and Corps.		Date of Joining at Roorkee.	Date of Government order appointing to D. P. W.	Remarks.
6	* G. O. Donnell.	Acting Corporal,..	1st E. B. Fusiliers, ...	July 8th, 1848,	March 24th, 1849.	4th Division Ganges Canal, Mynpooree.
7	J. F. M. Gowans	Gunner, ...	3rd C. 2d Battn. Artillery, ...	Aug. 18th, 1848.	....	Remanded at his own desire to his Corps.
8	* J. Davidson,	Serjeant, ...	1st Co. 3d ditto ditto, ..	Aug. 22d, 1848.	June 2d, 1849,..	5th Division Public Works, Benares
9	M. Ogle.	Serjeant, ...	Artillery (Expense Mag. Dumdum), ...	Aug. 22d, 1848.	Ditto ditto,....	1st Division Ganges Canal, Roorkee.
10	* J. R. Virgin,	Corporal and Pay Serjeant, ...	3rd Co. 2d Battn. Arty.,	Aug. 22d, 1848.	Ditto ditto,....	3rd ditto ditto, Boolundshuhur.
11	* P. Sexton, ..	Bombardier, . ..	3rd Co. 2d Battn. Arty.,	Feb. 19th, 1849.	Nov. 19th, 1849.	3rd ditto ditto. ditto.
12	* D. O. Wollaston,	Gunner, .. / Asst. Overseer,	1st Co. 3d ditto Arty., / D. P. W. Upper Assam,	Feb. 23rd, 1849,	Nov. 9th, 1849,	4th ditto ditto, Mynpooree.
13	P. FitzPatrick,	Gunner, ...	3rd Co. 6th Battn Arty.,	April 25th, 1849.	....	Progress delayed by continued sickness.

Number.	Names.	Rank and Corps.		Date of Joining at Roorkee.	Date of Government order appointing to D. P. W.	Remarks.
14	F. E. O. Donoghue, ...	Gunner, ...	3rd Co. 6th Battn. Arty.,	April 25th, 1849,	Jan. 15th, 1850,	1st Division Ganges Canal, Roorkee.
15	L. Dillon, ...	Bombardier, ...	1st ditto 6th ditto ditto,..	May 5th, 1849.	Jan. 15th, 1850,	2nd ditto ditto, Munglour.
16	*Wellsteed, ..	Corporal, ...	1st ditto 6th ditto ditto,..	July 2nd, 1849,	March 15th, 1850.	1st Division Grand Trunk Road.
17	G. Nolan, ...	Gunner, ...	4th ditto 4th ditto ditto,..	July 23rd, 1849.		
18	J. P. Rae, ...	Corporal, ...	4th ditto 2d ditto ditto,..	July 23rd, 1849.		
19	C. Swan, ...	Corporal, ...	2d ditto 1st ditto ditto,..	Aug. 28th, 1849		
20	S. S. Coorigan,	Bugler, ...	2d ditto 1st ditto ditto,..	Aug. 28th, 1849.		
21	W. Parker, ...	Serjeant, ..	4th ditto 3rd ditto ditto, attached to Ferozepore Magazine,	Jan. 8th, 1850.		
22	H. Mitchell, ..	Acting Corporal,..	2d E. B. Fusiliers, ...	Feb. 12th, 1850.		
23	D. Deady, ...	Acting Serjeant, ..	3d Co. 2d Battn. Arty.,..	Not joined.		
24	J. F. Lamion,..	Gunner, ...	1st ditto 3d ditto ditto,..	Ditto.		

The total number of applicants for admission up to the present date has been 55. The proportion passed, one-half.

THIRD (Native Surveyor) DEPARTMENT.

Number of Stipendiary Students—16.

The first two Students of this Department were noticed in the former Report.

Number.	*Names.*	*From what Place.*	*Date of*		*Appointment.*	*Monthly Salary.*	*Remarks.*
			Admission.	*Leaving.*			
3	Fyzool Hussun, ...	Delhie College,..	Jan. 1st, 1848,	Oct. 19th, 1849,	Native Surveyor under the Civil Engineer Punjab,	15 0 0	Since raised to 20.
4	Wujuhooddeen, ...	Munglour School,	Jan. 12th, 1848,	June 7th, 1849,	Draftsman, Office of the Superintendent of Canals,	30 0 0	
5	Pem Raj, ...	Dehlie College,..	Feb. 7th, 1848,	Sept. 24th, 1849,	Native Surveyor 4th Division Ganges Canal,	15 0 0	
6	Qumurooddeen, ...	do. do.,....	Feb. 8th, 1848,	Oct. 19th, 1849,	Native Surveyor under Civil Engineer Punjab,.	15 0 0	Since raised to 20.
7	Ruhmutoollah, ...	do. do.,....	March 3rd, 1848,	Mar. 21st, 1849,	Native Surveyor Bijnour District,	25 0 0	
8	Musseehoollah, ...	do. do.,....	May 10th, 1848,	Jan. 18th, 1850,	Native Surveyor 5th Division Ganges Canal, Etawah,	15 0 0	
9	Zafferooddeen, ...	Roorkee, ..	Dec. 1st, 1848,	Oct. 15th, 1849,	Native Surveyor Trans-Sutlej Survey,	15 0 0	Has since given up his appointment and returned to his home.
10	Jumeeut Alee, ...	Munglour, ..	April 2nd, 1849,	Oct. 15th, 1849	Attached to 2nd Division Ganges Canal, Munglour,	15 0 0	
11	Kunhya Lal, ...	Dehlie College,..	May 9th, 1849				
12	Jye Dyal, ...	do. do.,....	May 9th, 1849				
13	Abdoor Ruheem,....	do. do.,....	May 9th, 1849.	June 30th, 1849,			Withdrawn.
14	Qasim Alee, ...	do. do.,....	May 9th, 1849,	June 9th, 1849,			Gone to his home.

Number.	Names.	From what Place.	Date of Admission.	Date of Leaving.	Appointment.	Monthly Salary.	Remarks.
15	Gunga Dhur, ...	Dehlie College,..	May 9th, 1849,	Sept. 15th, 1849,			Gone to his home.
16	Mohummud Mirza,..	do. do.,....	May 9th, 1849,	Sept 15th, 1849,			do.
17	Mahboob Alee, ...	do. do.,....	May 9th, 1849,				
18	Moula Buksh, ...	Munglour, ..	June 1st, 1849,				
19	Lootfoollah Khan, ..	Roorkee Hospital, (Native Doctor,)	June 5th, 1849,				
20	Nasir Hoosein, ...	Roorkee, . ..	July 1st, 1849,				
21	Dildar Alee, ...	Dehlie College,..	Sept. 26th, 1849,				
22	Pearee Lall, ...	Bareilly School,..	Oct. 1st, 1849,				
23	Shib Sahae, ...	do. do.,....	Oct. 1st, 1849,				
24	Mashooq Alee, ...	do. do ,....	Oct. 22nd, 1849,				
25	Abdoor Ruhman,....	do. do.,....	Oct. 22nd, 1849,				
26	Abdoor Ruhman (2,)	Dehlie College,..	Nov. 21st, 1849,				
27	Musseehoollah (2,)..	do. do.,....	Nov. 21st, 1849,				
28	Qoodrutoollah, ...	Meerut, ..	Dec. 17th, 1849,				
29	Nuthoo Singh, ...	Roorkee, ..	Dec. 19th, 1849,				
30	Nuzur Hoosein, ...	Munglour, ..	Feb. 13th, 1850,				
31	Mohummud Ismael	Dehlie College, .	Mar. 11th, 1850.				

Note —The monthly salaries named above are those first received on joining an appointment or Department. The prospect held out, of increased allowances according to diligence and ability, in the Survey Departments rising to Rs. 65 and 70 per mensem.

FOUR EXTRA (non-Stipendiary) STUDENTS.

Number.	Names.	Date of Joining.	Date of Leaving.	Classes Attended.	Remarks.
1	A. Robertson, ..	March 1st, 1849,	Nov. 16th, 1849,	Drawing, ...	
2	E. Trotter, ...	April 27th, 1849,	July 23rd, 1849,	Surveying and Drawing, ...	
3	Nasir Hoossein,	June 2nd, 1849, ..	July 1st, 1849,	3rd Department, ...	Admitted to 3rd Department.
4	Prem Sookh, ..	June 4th, 1849, ..	Oct. 24th, 1849,	3rd Department, ...	Native Surveyor 2nd Division G. C. Munglour.
5	F. Hembrough,	July 3rd, 1849, ..	Oct. 12th, 1849,	2nd Department, ...	Road Superintendent Julundur Doab.
6	J. Edely, ...	Attendance occasio	nal, ...	Surveying and Drawing, ...	
7	C. F. Scott, ...	Dec. 17th, 1849, ..		Drawing, ...	
8	J. Todd, ...	Jany. 14th, 1850,		2nd Department, ...	
9	F. Platts, ...	Jany. 21st, 1850,		Hindoostanee and Drawing.	
10	T. Wharton, ..	March 13th, 1850,		2nd Department, ...	

The following Extracts from Lieutenant MACLAGAN'S *Report contain the fullest information of the progress and system of the College.*

FIRST DEPARTMENT.

"For admission to this Department there have been numerous "applicants. The number mentioned in the Tables is the number of "those whose applications were founded upon a definite idea of what "was required of them, and whose qualificationswere examined into. "The frequent misapprehensions regarding the nature of the entrance-"examination for this Department, and the qualifications requisite to "enable a Student to enter upon the course of Engineering here "pursued, seem to call for a few words of explanation. The Prospec-"tus names the subjects of which a knowledge is required. Many "Candidates next desire to be informed from what books they will be "examined on these subjects, and it is well it should be understood, "that it is with the subjects named, not with any particular book, "that an acquaintance is desired. Another error against which it has "appeared necessary to guard Candidates for this Department, is under-"estimating the importance of a familiar acquaintance with the more "elementary parts of their Mathematical studies, in which some have "been markedly deficient, whose attainments were very considerable "in the higher branches. The constant call for the use of the former "renders it necessary that the Students should be as much as possible "independent of books in their application. The Differential and "Integral Calculus is excluded from these entrance-examinations, not "having been named in the original Notification, though there can of "course be no question as to its practical value in the study of Engi-"neering. It may be mentioned that all who have hitherto entered "the Department are prepared by an acquaintance with the Calculus, "for the numerous illustrations of its practical bearings to be met with "in the course of their studies at Roorkee."

"A specimen is subjoined of the usual entrance-examination for "this Department."*

"It is necessary that native Candidates should comprehend also "the extent of acquaintance with the English language which is con-"templated in the 'ability to read and write with ease and accuracy' "prescribed as one of the requisite qualifications. It is defined in "the Notification of 9th October 1845, constituting the grade of Sub-"Assistant Engineers to be such an acquaintance as may 'enable them "to read, understand, and explain' English works on scientific subjects. "Writing is not here mentioned, and it may be observed that the "very miserable and careless penmanship, as well as incorrect spelling, "of many native Candidates, whose qualifications are otherwise high,

* *Vide* Appendix B.

" is no small disadvantage alike to themselves and to those whose task " it is to examine their work; or (when hereafter employed as subor- " dinate Engineers) to receive their reports."

" The subjects of study in the first Department may be briefly " enumerated under the following heads."

I.—Revisal of certain branches of Mathematics.

II.—*Materials.*—Strength of Materials, stability of Structures.

III.—*Construction.*—Masonry, Carpentry, Bridges, Foundations, Earthwork-Roads.

IV.—*Practical Hydraulics.*—Rivers, Drainage and Irrigation Canals.

V.—*Motive Powers.*—Machinery and Tools, Hydraulic Machines.

VI.—*Geodesy.*—Surveying and Levelling; Practical Astronomy; Trigonometrical Surveying.

VII.—*Outlines of Geology.*—Physical Geography; Meteorology.

" The book-information on these subjects is much scattered; and " on some of them is not yet available to the desired extent. With " the aid of the resources supplied since last Report, much has been " done to render the course more definite and complete."

" The small number of Students, as yet enrolled in this Depart- " ment, afford very limited data for report upon its working. The " results with respect to these few, are encouraging. There is no " want of aptitude for the handling of practical subjects when once " practical ideas have been acquired. There does seem to be a diffi- " culty at first in enforcing a transfer of the conceptions of mechanical " agencies and effects, from the words and diagrams of a book, to " real tangible objects. The results of increased familiarity with such " subjects, in the instance of the Senior Students of this Department " are satisfactory."

" Personal energy, self-confidence, independence, and decision, " are of much importance to practical men in the Department of " Engineering, qualifications which there are few opportunities of testing " at this College. Their absence may be suspected. There *is* at all " events observable, the nearly allied disposition to receive confidently " all that is read without sufficiently examining its truth, and to " be easily satisfied with any *given* amount of information, while testing " contentedly ignorant of what is not specially taught. It is endea- " voured to induce in the Student of this Department, a desire and " a habit of more extended investigation, and to encourage the exercise " of the powers which he already possesses."

"It is more as an exception in some measure to the prevalent "characteristic above noticed, than as an illustration of the success of "these endeavours, that the more promising efforts of the first Stu- "dents of this Class are particularly mentioned."

"In the Department of practical Astronomy as connected with "Geodesy, not much has yet been done for want of the requisite "instruments, the practice being limited to the use of the sextant, "and the more ordinary observations for time and latitude. This is "a Department of scientific labor in which it is probable that intelli- "gent natives will be found to excel."

SECOND DEPARTMENT.

"Of the value of this Department, efficiently worked, there can "be little question, and the results, as far as they can be exhibited at "the College, are on the whole very satisfactory."

"On the expiry of the prescribed probationary period of six "months, the Student is examined, and being found qualified, is "retained at the College for further study, two months longer, or "until the receipt of the order nominating him to the department of "public works. There are at all times passed Candidates on the "roll ready to supply vacancies as they occur. On the appearance "of the Government order removing one, application is made to Army "Head Quarters for the nomination of the next on the list, that the "prescribed number is always complete on the books, and actually "present, except for the interval between the departure of a Student "and the arrival of his successor."

"Several of the Students of this Department have shewn a "considerable aptitude for Mathematical studies, and have pursued "them to some extent beyond the limits of the prescribed course. "All are instructed in Plane Geometry, Mensuration, Algebra and its "application to Geometry, Plane Trigonometry, the measurement of "heights and distances, and the Elements of Mechanics. Their "reading on practical subjects may be detailed under the same heads "as that of the first Department, the subjects being taken up more "briefly, and treated more simply as the more limited time and attain- "ments of these Students require."

"There are advantages presented to these men by their position "at Roorkee, in the immediate neighbourhood, of extensive and varied "works connected with the Ganges Canal, which many have been slow "to appreciate. They are not singular in this respect, and it is proba- "ble that after some experience of the duties for which they are here "in training, a more intelligent attention would be paid to works "constantly in operation within their reach—the valuable lessons to be "derived from which they are too apt in general to overlook. It is

"but justice to those now present to say that this remark is less "applicable to them, and there have been many among their prede- "cessors likewise, from whom the questions on what was going on "elicited replies and remarks which showed that the Student had not "been an inattentive observer. It is matter of regret, that the questions "have so seldom come spontaneously from the other quarter, whilst "the attention thus manifested in particular instances gives good "ground to hope that much practical knowledge has been carried away "that will elsewhere be turned to account."

"Much the same observations may be made with respect to the "opportunities of obtaining information afforded by the College "Library which also are too apt to be neglected. The natural irk- "someness of study of any kind to men beyond the usual time of life "for receiving instruction, for the most part unused hitherto either to "the mental exercises of the Student or the quickening labours of the "Artizan, must be taken into account; and it is pleasing to be able to "add to this remark also the mention of marked exceptions."

"The Students of this Department are instructed in Oordoo in "the Persian character, and many have acquired considerable facility "in reading the printed and lithographed books. They are exercised "weekly in translation by means of written papers (in the English "character), in the forms of dialogues between European Overseers "and native workmen."

"As a natural consequence of the improved and more complete "course of instruction which has by degrees been adopted, the Assist- "ant Overseers the College now sends out may be said generally to be "much better prepared for the duties before them than those of the "first year; and future Students will be more favorably circumstanced "in some respects, when certain alterations now contemplated shall "have been introduced."

THIRD DEPARTMENT.

"The applicants for admission to this as to the other Departments "have been many, a large proportion having a very inadequate idea of "the qualifications necessary, which being very moderate are strictly "required in order that none may be admitted to the Department who "are not prepared to follow the instruction afforded in practical "Geometry, Mensuration and Surveying, without being delayed by a "want of sufficient knowledge of initial Arithmetic. A fair acquaint- "ance with the rules of Proportion, Vulgar and Decimal Fractions, "and an ability to read and write Oordoo in the Persian character "constitute the amount of previous proficiency required."

"Students received from other Colleges have been admitted on "the certificates of those Institutions. Several of these have previ-

"ously acquired some knowledge of Plane Geometry, some also of "Trigonometry, which gives them of course considerable advantage."

"The instruction consists of practical Geometry, with its applica-"tion in the field to surveying purposes,—measurement with the chain "and calculation of areas,—Surveying with the Prismatic Compass,—"Protraction by Bearings—Theodolite Surveying,—Protraction by "Traverses, and calculation of areas by the Universal Theorem;—"preparation of village field-maps, and detailed area statements as in "the Revenue Surveys;—Levelling and Construction of Sections."

"By the instruction in Topographical Drawing, Copying, Reducing "and finishing Maps and Plans, the Student is prepared for the correct "delineation of his own survey, when he has advanced to the execution "of work embracing a considerable extent of ground and minuteness "of detail. In this Department of their work, several of these native "Students have shewn great skill, and the most successful have further "been instructed in general Architectural Plan Drawing of a simple "kind: as many as desired, have also joined the class once a week for "Perspective and Pencil Drawing."

"There has been little difficulty experienced in importing a good "general knowledge of Surveying to the Students of this Department, "but to instil a just appreciation of the importance of minute accuracy, "(and, it should be added, of what constitutes minute accuracy,) alike "in the main outlines and in the minor details, is a work requiring more "attention. Defective powers of observation, and, for the most part, "defective *eye*, even when the observations have been secured, are "obstacles which, the latter at least, practical experience alone can "surmount. That in these particular respects a high degree of skill "and accuracy are attainable the correct results of the native modes "of land-measurement sufficiently evidence."

"It is desirable that the Students of this Department should "remain a longer time at the College than the call for their services "has allowed to the majority of those who have already left, in order "that they may have more practice in independent working, and "acquire some confidence in arranging their own method of procedure, "as well as in the use and adjustment of the instruments. The "demand for Surveyors, &c., has been and continues to be great. "There are now more requisitions on record than could be complied "with by drafting off the whole Department, were they prepared."

Extra (non-Stipendiary) Students.

"Several Students, it will be observed, in addition to those "regularly entered in the several Departments have attended the "College for instruction in one or more branches. Of these some "have been attached to the Canal Establishments at Roorkee, others "unemployed, have come to take advantage of the opportunities of

"instruction afforded by the College, with the view of qualifying "themselves for employment. One of the latter, whose assiduous and "successful application brought him into notice, obtained the appointment of Superintendent of Roads under a Local Committee in the "Julundhur Doab of the present value of Rs. 100 per mensem. "There are at present four of these unattached Students. It should "be understood that these, as well as the Stipendiary Students, must "have attained some previous proficiency, to enable them to avail "themselves of the instruction afforded."

Public Examinations. Defects in the present College arrangements.

"For annual examinations the present system does not afford "facilities. The admission of Students to "all the Departments is restricted to no "fixed dates; similarly, they leave the "College at all different times of the year. "This is productive of some inconvenience. All are working independently and do not probably, in this manner, learn so much or so well "as if the work of each were the work of all; the time of the teacher "is much lost, and his labor multiplied by the number of Students in "his Department; and a fixed course of study adapted to a certain "limited period is not so surely and satisfactorily pursued as it might "be under another arrangement. Such a set course being marked out, "it is desirable that it should be pursued systematically by all together, or, in two or at most three divisions. It is intended to submit "a special proposition on this subject, of which more need not be said "in this place, than that the length (estimated in time) of the course "recommended for the several Departments, is for the first, 3 years, "for the second, 1 year, and for the third, 1½."

Prizes.

"In consequence also of the existing arrangement, the prizes, "presented by the Visitor, cannot be competed for or assigned on a view of the "comparative merits of individuals, but are awarded to Students, on "their leaving the College, at the discretion of the Principal."

Drawing and Surveying.

"All the Students are instructed in Surveying, and in Topographical Plan Drawing; and in all the "Departments very creditable work has been "produced. The Drawing, by the 1st and 2nd Departments, of Architectural and Engineering constructions and working details, also "exhibit a very fair proportion of care and neatness of execution."

"To the 1st and 2nd Departments, a few Lectures have been "delivered on Elementary Mechanics, at such different times, dependent on the irregular changes above noticed among the Students, as "were found convenient."

In reply to Lieutenant Colonel Cautley who, as Visitor of the College, had forwarded the Reports, the Lieutenant Governor expressed his satisfaction with the present progress of the College and

its promise of future utility. It was no subject for regret, that the admissions to the first Class had been few, for the standard was necessarily high, and the advantages conferred by success must be first understood, before it could be expected that many Students would qualify themselves to pass the examination. Of the 2nd and 3rd Departments, the progress had been satisfactory, and the steady demand for the services of all who had past through them, was the best evidence of the soundness of the system pursued at the College, and the general confidence felt in it. The 3rd Department, in which instruction was conveyed through the medium of the Vernacular was regarded by the Government with much interest as well calculated to work upon the public mind, and to provide efficient instruments for the public service at a small cost.

To further these objects it was highly desirable that a course of publications should be compiled in the Vernacular, either translations from European works, or original treatises, bearing on the subjects studied at the College. The attention of the Principal had been drawn to this point, and he might depend on every assistance from Government in the prosecution of his task.

From the list of the Students in the 3rd Department it appeared that many of them had received their elementary instruction at the neighbouring town of Munglour. This was worthy of notice, as the first opening of a future field of useful labor to the officers connected with the Canal. It was highly probable, as the prospects held out by the Roorkee College became better understood, that rudimentary Schools of this Class would spring up in many of the large towns bordering on the line of the Canal. Though the Government was not prepared to undertake the foundation and maintenance of such Institutions, yet it was most ready to encourage them by occasional rewards and assistance, and if the Principal of the College, with the aid of the other officers connected with the Canal, would superintend a machinery of Visitors, similar to that lately extended over a large portion of these provinces, but bearing particularly on Schools devoted to the rudiments of Science, a limited sum from the Education Fund should be placed at his disposal for that purpose. This suggestion has been acted on, and the arrangement will be noticed in the report for the present year.

On the 18th May 1849, the College which had hitherto been merely an experimental one, was placed on a permanent footing by the arrival of the sanction of the Hon'ble Court of Directors to its establishment. The Accountant was accordingly directed to debit all future charges to the general expenditure of the country, as distinct from the sum set aside for educational purposes. Lieutenant Colonel Cautley, Ex-officio Visitor, was however advised, that the change in the mode of charging the expences of the College in the public accounts involved no alteration in the supervision or system. His attention was at the same time drawn to the large expenditure incurred on account

of books and instruments, and he was requested to ascertain and report the limit within which such charges should in future be restricted.

In reply Colonel Cautley proposed that a sum not exceeding 1,200 Rupees per annum should be put at the disposal of the Principal for the purchase of the books, &c., necessary for the College, and that he should also be allowed to procure a stock of the cheaper cases of instruments. These would from time to time be sold to the Students at cost price, and the proceeds credited to Government, which would thus be put to no expence, while each Overseer, on entering his duties, would find himself provided with the means of carrying on his work, at a lower cost and of a better quality, than he could have purchased for himself.

This latter proposition was approved of, and on the 25th January 1850, Lieutenant Maclagan was authorized to procure from England 30 Cases of Mathematical instruments at 20 Rupees per case. He was, however, informed that the Government objected to the system of fixed allowances for the libraries of its educational establishments, and preferred that special application should be made from time to time, for the purchase of such works as might be required.

In December 1849, Lieutenant Colonel Cautley proposed that the 2nd Class of the College should be enlarged by an increase of 10 Students. Under the present limits the outturn of trained Students from this Department was 6 annually, a number quite inadequate to the demands of the Canal alone, even if they could all be assigned to that branch of the public service. The system upon which the men were educated was so good, and the facilities for self-improvement, offered by the works and workshops at Roorkee, so great, that he had no hesitation in making this recommendation. In accordance with Lieutenant Colonel Cautley's proposal, and on the recommendation of the Military Board in Calcutta, the limit of the Class was raised to 16, its present number.

In March 1850, upon an application from Lieutenant Maclagan for sanction to the purchase of certain works, Colonel Cautley was requested to state, whether any necessity existed for a library at the College distinct from that attached to the Ganges Canal, and if so, what were the objects for which the two libraries were required. In his reply, Colonel Cautley observed that as the two libraries were intended for different Classes of readers, the one for Students and beginners in Science, the other for practiced Engineers, it would be better to keep them distinct. To obviate all danger of the accumulation of duplicates, he however proposed that the Principal of the College should be directed to submit a list of proposed purchases to the inspection of the Visitor, who would strike out such as he might consider more suited to the professional library. The two collections would of course be always equally open to the Students.

BAREILLY SCHOOL.

13TH YEAR.

List of the Members of the Local Committee, Bareilly School.

NAMES.	DESIGNATION.
H. Pidcock, Esq., ...	Commissioner.
S. Fraser, Esq., ...	Judge.
F. Williams, Esq., ...	Magistrate and Collector.
E. Wylly, Esq., ...	Joint ditto.
Major Glasfurd, ...	Executive Engineer.
Capt W. Jones, ...	Superintendent of Embankments.
Dr. K. Kirk, ...	Civil Surgeon.
H. Berkeley, Esq., ...	Late Principal Sudder Ameen.
Baboo Chait Ram, ...	Tuhseeldar.

BAREILLY SCHOOL: 31st *May*, 1850.

(Signed,) V. TREGEAR,
Secy. Local Committee.

Establishment of the Bareilly School, April 30th 1850.

NAMES.	DESIGNATION.	AMOUNT.	DATE OF APPOINTMENT.
V. Tregear, Esq., ..	Superintendent, ...	500 0 0	January 10th, 1845.
Mr. H. Templeton,	Head Master, ...	250 0 0	January 15th, 1850.
Mr. C. Gill, ...	Offg. 2nd Master, ...	150 0 0	February 24th, 1849.
Luchmun Pershad, ..	3rd Master, ...	100 0 0	May 21st, 1847.
———4th., ...	Vacant, ...	50 0 0	
Mr. G. Platts, ...	Supernumerary, ...	150 0 0	May 2nd, 1849.
Zoolfiqar Ali, ...	1st Persian Teacher, ..	50 0 0	February 24th, 1846.
Qootub Shah, ...	2nd ditto, ...	20 0 0	March 1st, 1846.
Juwad Ali, ...	Vernacular Teacher, ..	40 0 0	May 1847.
Jeesookh Ray, ...	2nd ditto, ...	20 0 0	January 1st, 1846.
Ishree Pershad, ..	Librarian, ...	10 0 0	January 1st, 1846.
	Peon, ...	4 0 0	
	Duftree, ...	4 0 0	
	Assistant ditto, ...	4 0 0	
	Durwan, ...	4 0 0	
	Bearer, ...	4 0 0	
	Sweeper, ...	4 0 0	
		1364 0 0	
	Contingencies, ..	12 0 0	
	Total Rs., ..	1376 0 0	

BAREILLY SCHOOL: 31st *May*, 1850.

(Signed) V. TREGEAR,
Secy. Local Committee.

List of Scholarships as held at the Bareilly School, on the 30th April 1850.

NAMES.	DESIGNATION.	AMOUNT.
		Rs. As. P.
Doorga Pershad,..	English Scholarship, ...	15 0 0
Uzmut Oollah, ...	Ditto ditto, ...	10 0 0
Ram Pershad, ...	Ditto ditto, ...	10 0 0
Ali Ahmud, ...	Ditto ditto, ...	6 0 0
Gujraj Sing, ...	Ditto ditto, ...	5 0 0
Sunt Lall, ...	Ditto ditto, ...	4 0 0
Dabi Pershad, ...	Ditto ditto, ...	4 0 0
Soondur Lall, ...	Ditto ditto, ...	3 0 0
Ramdial, ...	Ditto ditto.	2 0 0
———	Ditto ditto, ...	2 0 0
Agha Ali,..	Oriental Scholarship, ...	10 0 0
Mahommed Hosein, ...	Ditto ditto, ...	10 0 0
Jameel Ooddeen, ...	Ditto ditto, ...	10 0 0
Sahib Raye, ...	Ditto ditto, ...	5 0 0
Moorlee Dhur.	Ditto ditto, ...	5 0 0
Gopal Pershad, ...	Ditto ditto, ...	5 0 0
	Total Rupees, ...	107 0 0

(Signed) V. TREGEAR,

Secy. Local Committee.

BAREILLY SCHOOL:
31*st May*, 1850.

Statement of the Number, Caste, &c., of Students as on the 30th April 1850.

Statement shewing the number of paying Students, amount paid by them, also Students who do not pay.				Statement shewing the number of Students studying each of the languages taught.			Castes of Students.		
Non-paying.	*Paying and amount realized during the year.*	*Amount of Entrance Fees realized.*	*Total.*	*English and Oordoo.*	*Persian.*	*Hindi.*	*Christians.*	*Hindoos.*	*Mussulmans.*
	Rs. A Paying, 245 0 Amount, 541 9	Rs. A. P 90 0 0	Rs. As. P. 631 9 0	174	57	14	0	186	59

BAREILLY SCHOOL:
May 31st, 1850.

(Signed) V. TREGEAR,
Secy. Local Committee.

Statement of the Receipts and Disbursements of the Bareilly School during the official year 1849–50.

Resources of Annual Income.							Actual Charges during the Year.		
Separate Fund.	Assignment from Parliamentary Grant.	Total.	Assignment from Additional Grant.	Establishment fixed by Government.	Tuition Fees.	Grand Total of Receipts.	Nature of Charges.	Items.	Total.
							English Teachers, ...	1454 9 7 5	
							Oriental ditto, ...	1560 0 0	
							Scholarships, ...	1167 0 0	
							Servants, ...	288 0 0	
							Librarian,..	120 0 0	
				15996 0 0	*631 9 0	16627 9 0	Fixed Contingencies, ...	136 3 0	
							Contingencies, ...	518 9 4	
							Surveying Instruments, ...	352 0 0	
							† Prizes, ...	196 0 0	
									18887 3 9

* Including Rs. 90, Admission Fees. † Including Rs. 100 Annual Donation from J. Lean, Esq., C. S.

Bareilly School: *May 31st*, 1850.

(Signed) V. TREGEAR,
Secretary Local Committee.

The annual examination commenced on the first Monday in December, and ended on the 24th of the same month.

Of the 210 Students on the lists of the School in January 1849, 76 had left in the course of the year. Of these five had obtained employment and four had been admitted to the Roorkee College.

During the same period, the admissions had numbered 62, so that the School at the end of the year contained 14 fewer pupils than at its commencement. Many of the removals had, however, been consequent on the departure of the Regiments cantoned at Bareilly, and the deficiency has already been made up from the lately arrived Corps.

The attendance throughout the year had been good, and the newly admitted Students were of a better Class than had previously been the case. Rs. 639-1 had been received during the year for entrance and tuition fees.

The Arabic and Mathematical questions were set by Government. Those on the other subjects were prepared by the Head Master.

The Historical papers were examined by Mr. Pidcock, who reported as follows :—

" Doorga Pershad has acquitted himself well both in English and Indian History. His answers evince a very competent knowledge of the subjects he has been reading; his memory appears to be retentive, for many of his answers are in Hume's own words. His Grammar and Spelling are both good. Oommut Ollah ranks next, and he would have shone better, had I not rejected some of his answers from their close resemblance in wording to those given by Alee Ahmed. These remarks apply also to Alee Ahmed. Bholanath and Shib Sehai have acquitted themselves very creditably. The spelling of the boys is remarkably good—not so their Grammar and Composition, in which they require to be more thoroughly exercised."

The papers of the English Astronomical and Mathematical Classes were examined by Dr. Kirk with the following results, " I have perused the exercises of the Scholars in Astronomy and Mechanics, and consider them very satisfactory and creditable. The best papers are those of Doorga Pershad and Ram Pershad. The errors are chiefly of defect and do not arise from mis-understanding the subject, while some of the Scholars in their answers do not confine themselves closely to the question with which they are engaged; one for instance gives an account of the Theodolite and its adjustments in reply to a question as to the corrections applied to the altitude of a heavenly body. Still the answers all display a good deal of general information and proficiency."

The Mathematical papers of the English Class were submitted to Major Glasfurd, who was unable to examine them, as he was on the point of starting for his official tour. They were consequently looked

over by the Head Master, who considered that the majority of the Class had done themselves credit in every way, but in their handwriting.

All the papers of the Persian Classes (the Arabic excepted) were examined by the Head Master. The questions were chiefly those put to the English Classes and the answers of the Students were creditable to them.

The 2nd and other Junior English Classes were all examined by Dr. Kirk, at various times during the month of December.

The Committee recommended, and the Government sanctioned the following Scholarships for the year 1850.

1st Eng. Class.	Doorga Pershad,	20	
	Uzmut Oollah,	10	
	Ram Pershad,	10	
	Alee Ahmed,	8	
	Shib Schai,	8	
		—	56
2nd Eng. Class.	Sunt Lall,	5	
	Dabee Pershad,	5	
	Soonder Lall, 1st,	4	
	Ram Dial, 1st,	4	
		—	18
	Agha Alee,	10	
	Jumeel Ooddeen,	10	
	Sahib Rai,	10	
	Mahomed Hosein,	8	
	Fakhroo Deen,	10	
	Moorlee Dhur,	5	
		—	53
	Total Rupees,		127

In the course of his report, the Head Master complained that the Oriental Classes labored under a great disadvantage in having no Scientific works fit for their use, or reference.

In reply he was informed that exertions were being made to supply the want, but that for the present, however faulty the existing Oordoo Versions of such books may be, they were found available in the Dehlie and other Colleges for the instruction of the Oriental Departments.

In the month of March, Mr. Wiggins, the second Master, was transferred to the Agra College, and Mr. Templeton appointed in his place. Mr. Gill was transferred from the Agra College and Mr. Platts joined the Bareilly School, as a Supernumerary in June.

SAUGOR SCHOOL.

14TH YEAR.

Return of the Local Committee, as on the 30th April 1850.

Saugor, 15th May, 1850.

NAMES.	DESIGNATION OF OFFICE.
Captain E. K. Elliot, ...	Dy. Commissioner, 1st Class, Secy. L. C. P I.
Lieutenant H. Montgomery ,.	Dy. do., 3rd do., "on deputation to Seonee."
Moulvie Syud Alli Hussen, ..	Sudder Ameen.
Moulvie Mahomed Hadi Alli,	Moonsiff.
Rao Anunt Rao Bhya Sahib, ..	Talooqdar of Jysingnugger.

Establishment as on the 30th April 1850.

Saugor, 15th May, 1850.

NAMES.	DESIGNATION.	SALARY.	DATE OF APPOINTMENT.	REMARKS.
		Rs. A. P.		
ENGLISH DEPT.				
James Rae, ...	Head Master,..	300 0 0	12th June, 1837.	
W. H. Bachman, ..	2nd ditto, ..	*200 0 0	11th May, 1846.	
Gunput Bhundary, ..	Librarian, ..	10 0 0	1st Sept., 1847.	
VERNACULAR DEPT.				
Hindee.				
Beharee Prohit, ...	1st Teacher, ..	25 0 0	15th March, 1842.	
Kunhiram, ...	2nd ditto, ..	20 0 0	17th April, 1847.	
Bhola, ...	3rd ditto,.. ..	15 0 0	15th March, 1842.	
Nundroy Purameck,....	4th ditto,.. ..	15 0 0	18th do., 1850.	Acting For 4th Teacher, deceased.
Durga Singh, ...	5th ditto,.. ..	15 0 0	18th do., 1850.	do.
Kunhya Loll, ...	Asst. ditto,.. ..	5 0 0	18th do.. 1850.	do.
Muhraj Singh, ...	Monitor, ...	2 8 0	18th do., 1850.	do.
Ramchund, ...	ditto, ...	2 8 0	1st May, 1848.	
Oordoo.				
Ghoolam Russool, ..	1st Moulvie, ..	25 0 0	27th Oct., 1843.	
Abdoolsalam, ...	2nd ditto,.. ..	50 0 0	1st March, 1847.	
Servants, ...	1st Bearer, ..	4 0 0	15th do., 1842.	
	2nd ditto, ..	3 0 0	15th do., 1842.	
	Bhishtee, ..	2 0 0	15th do., 1842.	
	Peon, ...	3 0 0	15th do., 1842.	

* Personal allowance, authorized allowance for 2nd Master Rs. 80 per mensem.

(Signed) E. K. ELLIOT, CAPTAIN,
Secy. L. C. P. I.

List of Scholarship in the Saugor Government School for 1850.

Junior Scholarship held by Kunhya Lall,..	8 0 0	Joined the Agra College, on the 1st July 1847.

Statement exhibiting the Number, Caste, &c., of the Pupils in the several Departments of the Saugor Government School, as on the 30*th April* 1850.

English Department.			Hindee Department.			Oordoo Department.			Total.			Total of all Castes.
Christians.	Hindoos.	Mussulmans.	Christians.	Hindoos.	Mussulmans.	Christians.	Hindoos.	Mussulmans.	Christians.	Hindoos.	Mussulmans.	
3	53	3	0	81	11	0	48	12	3	182	26	211

Statement exhibiting the Number of paying and non-paying Pupils in the several Departments of the Saugor Government School, as on the 30*th April* 1850.

English Department.		Hindee Department.		Oordoo Department.		Persian Department.		Total.	
Paying.	Non-paying.	Paying.	Non-paying.	Paying.	Non-paying.	Paying.	Non-paying.	Paying.	Non-paying.
0	59	0	92	0	60	44	0	44	211

N. B.—The Scholarship is now believed to be vacant. As the holder of it Kunhya Lall is employed as Second Master at the School in Jyepore, but no intimation of his having left the College has been received.

(Signed) E. K. ELLIOT, Captain,
Secy. L. C. P. I.

Local Receipts and Disbursements of the Saugor Government School during the official year 1849-50.

Saugor, 15th May, 1850.

Resources of Annual Income.							Actual Charges during the year.			
Separate Funds.	Assignment from Parliamentary Grant.	Total.	Assignment from Additional Grant.	Establishment and expences as fixed by Government, dated 23rd January 1841.	Tuition Fees.	Grand Total of Rupees.	Nature of Charges.	Items.	Total.	Remarks.
							English Teachers,	6000 0 0	6000 0 0	
							Librarian,	120 0 0	120 0 0	
							Vernacular Teachers,	1200 0 0	1200 0 0	
							Establishment,	144 0 0	144 0 0	
	4776 0 0	4776 0 0	2364 0 0	7140 0 0	229 1 9	7369 1 9	Junior Scholarship,			
							Purchase of Books as per Circular No. 23,			
							Contingencies,	108 4 3	108 4 3	
							Prizes,	96 0 0	96 0 0	
							Oordoo Teachers,	900 0 0	900 0 0	
							Grand Total,		8568 4 3	

At the time of the examination the number of pupils in each Department of the School was as follows:

English Department, ...	49	
Hindee Ditto, ...	104	
Oordoo Ditto, ...	59	
		212

In this number were included 42 boys, who had been reading Persian in addition to their more regular studies.

The absentee rules had been strictly enforced throughout the year, 30 boys had been dismissed for irregularity, and readmitted only after payment of a new Entrance fee. The attendance had consequently been much better than in previous years.

The total amount realized from Tuition fees during 1849, was,—

Entrance fees in the three Departments,	107	0	0			
Persian paying Class, ...	118	7	1			
				225	7	1

The Committee was not yet prepared to recommend the enforcement of the further measure of demanding a monthly payment from children whose parents were in good circumstances.

Four of the senior pupils had, during the year, obtained employment in the Deputy Commissioner's Office, where they were reported to have given great satisfaction.

The applications for admittance to the English Class had exceeded in number those of any previous year, and the desire for English knowledge was evidently on the increase; while the institution generally appeared to be appreciated by the inhabitants of Saugor, and was resorted to by the children of all Classes.

ENGLISH DEPARTMENT.

This Department consisted of four Classes, the first of which had during the year been drained of all its old members but one. Some difficulty had consequently been experienced in keeping up the standard of the Class, though the progress of the boys, taken individually, had been very fair. The Head Master had adopted the system of written tasks, as punishments for idleness or inattention, and a marked improvement in diction, spelling, and writing had resulted from the plan. The subjects read by this Class, are noted in the margin.*

Geometry.
Algebra.
Mensuration.
Arithmetic.
Composition.
Translation.
Geography.
Poetry.
History.
Grammar.

The boys of the 2nd, 3rd and 4th Classes had been steady at their studies, and some of them were attaining a good knowledge of English.

HINDEE DEPARTMENT.

Mr. Rae, the Head Master, had given much attention to the five Classes, which composed this Department, in the hope of stimulating their Masters, to remove by their exertions the stigma which had attached to them from the unfavorable report of the Committee in 1848. His endeavors had however met with but partial success.

The Gooroos appeared well qualified for their posts in other respects, but they had betrayed great apathy and carelessness in neglecting to impart to their pupils the knowledge which they undoubtedly possessed themselves.

The boys of the senior Class had apparently made but little progress. Those below them were more promising; they had constantly been practised in theme writing, and attention had been payed to their Grammar: they had consequently improved much in their power of original composition.

OORDOO DEPARTMENT.

Moulvees Gholam Russool and Abdool Sulam continued to merit the high reputation which they had already earned as teachers. The Classes under them had made rapid and satisfactory progress, and were in good and regular order.

The Persian Class had been taught by Moulvee Immamooddeen, with the assistance and supervision of the two other Moulvees.

No great advance had been made by this Department in Science and European knowledge, but this, though desirable, could hardly have been expected, as Persian and Oordoo are languages foreign to this part of the country, and are studied, not with the object of gaining information through their medium, but only as a means of obtaining employment in the Government Offices. The difficulties which the Moulvees had to contend against were therefore much greater than those to which teachers are exposed in the northern parts of Hindoostan, where these dialects are the common language of the educated Classes.

All the boys of the English Department devoted part of their time to the study of Hindee, or Oordoo; the choice being left to themselves. In the same way those of the Oordoo Classes spent some portion of each day in the study of Hindee. This arrangement entailed much additional duty on the Ordoo and Hindee teachers.

The Committee regretted to report that no boy had passed a sufficiently good examination to entitle him to the gold medal, a reward which was only due to attainments of a high order. Gunput, who held the first place might have been deemed deserving of the prize, but for his deficiencies in one or two branches of study. It was hoped that he would correct this omission, and become entitled to the medal at the next examination.

JUBBULPORE SCHOOL.

13TH YEAR.

Return of the Local Committee as on the 30th April 1850.

NAMES.	DESIGNATION.
Captain A. Skene,.....	Dy. Commissioner, Offg. Secy. from the 16th March, 1850.
Major J. Macadam,.....	Deputy Commissioner, *(absent.)*
G. M. Cheyne, Esq.,.....	Civil Surgeon.
M. Smith, Esq.,....	Civil and Sessions Judge.
Captain J. Sleeman,.....	General Superintendent Thuggee, *(absent.)*
Moulvi Reazool Hosseln, ...	Principal Sudder Ameen.
Baboo Shama Churn Dutt,.....	Sub-Assistant Surgeon.

(Signed) A. SKENE,
Offg. Secy. L. C. P. I.

Detailed Statement of the Salaries and Establishment of the Government School Jubbulpore, as on the 30th April 1850.

DATE OF APPOINTMENT.	NAMES OF INDIVIDUALS.	DESCRIPTION OF SERVICE.	SALARY.	TOTAL.
	English Department.			
16th April, 1842,*	Mr. S. E. Marston, ...	Head Master, ...	200 0 0	
1st November, 1845,....	Mr. B. Concannon, ...	Second Master, ..	75 0 0	
2nd May, 1846, ...	Bhao Pundit, ...	Monitor, ...	10 0 0	
1st July, 1849,.....	Narain Rao, ...	Ditto,.....	10 0 0	
				295 0 0
	Oordoo Department.			
8th July, 1845,.....	Viziyet Ali, ...	Oordoo Teacher, .	25 0 0	
				25 0 0
	Hindee Department.			
1st July, 1849, (a).....	Lala Beharee Lall,.....	Hindee Teacher, .	15 0 0	
10th July, 1845, ...	Munrakhun,.....	Ditto,....	15 0 0	
18th August, 1836,(b)....	Lala Durlao Sing, ...	Ditto,.....	15 0 0	
				45 0 0
	Servants,.....	Durwan, ...	3 0 0	
		Bearer, ...	3 0 0	
		Sweeper, ...	2 0 0	
				8 0 0
	Contingencies, ...	House-rent,.....	11 0 0	
				11 0 0
		Total,	.....	384 0 0

JUBBULPORE : 28th May, 1850.

(Signed) A. SKENE,
Offg. Secy. L. C. P. I.

(Signed) S. E. MARSTON,
Head Master, G. J. S.

* Previous service in the Educational Department, six years.
(a) Served as Monitor in the Jubbulpore School, six years.
(b) Previous service in Government employ, twenty years.

Number and Caste of Students attending the Government Jubbulpore School on the 30th April 1850.

DEPARTMENTS.	PAYING.	NON-PAYING.	AMOUNT PAID FOR APRIL.	CHRISTIANS.	MAHOMEDANS.	HINDUS.	TOTAL.	GRAND TOTAL.
English,.....	17	78	3 14	1	13	81	95	257
Hindee,.....	23	92		0	4	111	115	
Oordoo,.....	5	42		0	29	18	47	

(Signed) A. SKENE,
Offg. Secy. L. C. P. I.

(Signed) S. E. MARSTON,
Head Master, G. J. S.

Statement of the Receipts and Disbursements of the Government Jubbulpore School, during the official year 1849-50.

Resources of Annual Income.							Actual charges during the Year.		
Separate Fund.	*Assignment from Parliamentary Grant.*	Total.	*Assignment from Additional Grant.*	*Expence incurred for Establishment.*	*Tuition Fees.*	*Grand Total of Receipts.*	Nature of Charges.	*Items.*	Total.
							English Department, ...	3540 0 0	
							Oordoo Department, ...	300 0 0	
							Hindee Department, ...	540 0 0	
							Establishment, ...	96 0 0	
	1536 0 0	0 0 0	3396 0 0	*4608 0 0	72 3 2	5011 0 7	House Rent, ...	132 0 0	
									4608 0 0
							Additional Charge.		
							Salary of Monitors for Vernacular Departments.	72 0 0	
									72 0 0
							Balance in hand, ...	..	331 0 7
									5011 0 7

* Establishment fixed by Government in 1842 = 4932-0-0.

Jubbulpore
The 15th May, 1850.

(Signed) A. SKENE,
Offg. Secy. Local Committee P. I.

Owing to the absence from the station of most of the Members of the Committee, the annual examination was not held till the 23rd March 1850.

The total number of Students at that date was 263, of whom 91 were comprised in the 6 English Classes, 43 in the Oordoo, and 134 in the Hindee Department.

The constituency of the School had increased during the past year by 94 pupils, a result which the Head Master attributed to the increased favor with which the Institution was regarded by the inhabitants of Saugor and its vicinity.

In this favorable opinion the Local Committee did not coincide. Through their Secretary they represented that though the numbers of the School had increased, the standard of proficiency had fallen off in a marked degree. This had been more particularly the case as regarded the English Department, which was neither appreciated, nor indeed wanted, by the people of the district, of whose disinclination to allow their sons to remain long enough under tuition to obtain any real advantage, the Head Master had frequently complained.

The Oordoo and Hindee Departments were in a better state, but even they could hardly be said to be flourishing, and the Committee had felt compelled to decline a proffered Scholarship of 4 rupees per mensem, on the ground that there was no boy at the School deserving of such a reward. A School, for the most advanced pupils of which so little could be said, could not be held to be fulfilling the object for which it had been founded, and the Committee were accordingly of opinion, that the sums, now expended in support of the Saugor Institution, might be spent more profitably elsewhere, or in some other manner.

In reply to the representation of the Committee, the Lieutenant Governor observed that he had for some time held an opinion unfavorable to that Class of Government Schools, of which those at Saugor and Jubbulpore were the only remaining examples. Small Institions, such as these, neither afforded the means of advanced instruction, nor held out sufficient rewards for ability and application, while in some points they were positively injurious, as discouraging private enterprise, and divesting part of the Educational Fund from more useful employment. The Government was accordingly inclined to adopt the recommendation of the Committee and to close the School.

But though the experiment of an Educational Establishment on a confined scale had failed, there appeared some reason to believe, that a College, liberally endowed, on the same footing with those of Agra and Dehlie, might afford that stimulus and incentive to exertion, which

the smaller Institution had never offered, and might thus become a head and nucleus to the educational movement in a part of Central India, the inhabitants of which are debarred by its distance and inaccessibility from participation in the advantages of the larger Government Colleges, as at present existing.

Such an undertaking could not of course be entered on without the fullest information, and most careful consideration. The Committee were accordingly requested to report what degree of success might be expected to attend the plan, whether the country was yet ripe for it, and if so, whether Jubbulpore or Saugor would offer the most favorable position for such an Institution.

APPENDIX.

APPENDIX.

AGRA COLLEGE.

Subjects in which Competitors for gaining or holding Scholarships in the English Department are expeeted to qualify themselves during the year 1850.

1st Class.—Addison's Essays; Milton's 4 Books; Shakespeare's Macbeth, Hamlet, Midsummer-Night's Dream; Hume's Henry VIII., Elizabeth and Charles 1st; Gibbon's Reign of Justinian, and the History of Mahomed and of the Caliphs; Paley's Natural Theology; McCulloch's Political Economy; Lectures on the Mogul Empire and British India.

Additional Reading required of Senior Students.

Shakespeare's King John and Henry IV., parts 1st and 2nd, and Henry V.; Hume from the commencement to the Commonwealth inclusive; Gibbon's 1st, 2nd and 3rd Chapters; (Rome under the Antonines), Chapter 44th on the Pandicts, and Chapter 68th, the downfall of the Roman Empire in the East; Blackstone's 1st volume.

Science.

1*st Division.*—Pratt's Principles of Mechanical Philosophy, Statics, and first 2 Books of Dynamics; Phelp's Optics; Hymer's Astronomy; Hymer's Theory of Equations.

2*nd Division.*—The Differential Calculus; the Conic Sections; Plane and Spherical Trigonometry; Mechanics as taught in Whewell's Elements L. U. K.

Both Divisions.—The Principles and Practice of Topography and Elements of Architectural Drawing; Experimental Philosophy as taught in the Principal's Lectures.

2nd Class.—Richmond's Selections; Pope's Essay on Criticism and Goldsmith's Traveller, *History.*—Marshman's India; Goldsmith's Greece and Rome, and the Eton Chronology of England.

Geometry.—The first 6 and the 11th and 12th Books of Euclid. *Algebra.*—As far as Simple Equations inclusive, and Arithmetic generally; Introductions to Mechanics, Hydrostatics and Pneumatics L. U. K.; Political Economy and Yate's Geography, the whole of each.

3RD CLASS.—The whole of Prose Reader, No. 5, and Poetical Reader, No. 4; the whole of Yate's Geography; Outlines of the History of England, and Marshman's Brief Survey of History, part 1st; the first four Books of Euclid and Arithmetic generally; Algebra, as far as Involution and Evolution.

4TH CLASS.—The half of Prose Reader, No. 5, and Poetical Reader, No. 3; Outlines of Geography with the form and divisions of the Earth; Arithmetic, as far as Compound Proportion; the first Book of Euclid.

NOTE.—The studies of the Classes Junior to the above will be similarly graduated downwards.

Studies of the Oriental Department of the Agra College, in which Competitors for Scholarships are expected to qualify themselves during the year 1850.

ARABIC CLASS.—1*st Division.*—Hidayah, the last half; Towarikh Yemunee, half; Towzee, (Law) the whole; Soolum, (Logic) Humdoolla; the Regulations; Kholasa Mal ka.

2*nd Division.*—Furayez-i-Shureefee, the whole; Shashee, the whole; Maibudee, the whole.

3*rd Division.*—Arabic Grammar and Reader, the whole; Meer Zahid Moolah Jân, the whole; Muqamat Harreeri, the whole.

The whole Class.—History of India, and Clift's Geography; Arithmetic and Algebra as far as Simple Equations; Euclid and Plane Trigonometry.

1ST PERSIAN CLASS.—1*st Division.*—Towqeyat Kisra, the whole; Iqhlaq-ool-Nasreen, Qusaid Anvarri, Qusaid Oorfee, the whole; Abdool Vusay, the whole; Quwaid Farsee, (Chargoolzar) Punjrooqa, Zahoory, the whole; Nul Dumun.

2*nd Division.*—Euclid and Plane Trigonometry; Arithmetic and Algebra to Simple Equations; History of India and Clift's Geography.

2ND PERSIAN CLASS.—1*st Division.*—Sikundernamah 200 pages; Aboolfuzl 200 pages; Chargoolzar 50 pages; Madhoram, 100 pages.

2nd Division.—Insha Khaleefa, the whole; Goolistan, 20 pages.

Both Divisions.—Arithmetic, &c.

1st Oordoo Class.—*1st Division.*—Iqhlaq Jellalee; Gilchrist's Risala; Bagh-o-Bahar, the whole.

2nd Division.—Ditto, a part of ditto, a part of ditto ditto.

1st Sanscrit Class.—Siddhant Kowmdi, from page 500 to 600; Prowr Munorma, 100 pages; Mitakshara Achar Addhiai, 100 pages; Ootur Ram Charitr Natuk, the whole; Sankyatuta, Kowmdi, 50 pages; Siddhant Chandroday to Pretioh Kshant.

2nd Division.—Mudh Siddhant Kowmdi, 100 pages; Rughoovunsh Kavya, the whole; Magha Kavya, 200 pages.

2nd Sanscrit Class.—Magha Kavya, from page 280 to 554; Rughovunsh Kavya, 437 pages; Mudha Kowmdi, 170 pages; Brief Survey of History, and Clift's Geography: Lelavutti, Bij Gunitu, and Arithmetic, the whole; Euclid's 4 Books; Algebra, the fundamental Rules.

1st Hindi Class.—Mahabharut 3½ volumes; Ramayan, the whole; Clift's Geography, the whole; Euclid, 1st, 2nd, 3rd, 4th, and 6th Books.

Note.—The studies of the Classes Junior to these, in each Department, will be graduated downwards similarly.

By order,

(Signed) J. MIDDLETON,
Secy. L. C. P. I., Agra.

Agra College:
January, 1850.

DEHLIE COLLEGE.

Course of Study proposed to be followed in the Dehlie College, during the year 1850.

English Department.

1*st Class* 10 *Pupils.*

1. Shakespeare's Julius Cæsar and Lear.
2. Richardson's Selections, from page 431 to page 464, (Milton).
3. Spectator, from number 191 to 287.
4. Schlegel's History of Literature, chapters 8, 9, 10 and 11.
5. Steward's Philosophy of the Human Mind, art 2nd, the first 6 chapters.
6. Campbell's Rhetoric, Book 1st.
7. Elphinstone's History of India, 2 volumes, the whole.
8. Gibbon's Decline and Fall of the Roman Empire, chapters 37 and 38.
9. Herschell's Preliminary Discourse, 1st and 2nd parts.
10. Brinkley's Astronomy, first 7 chapters.
11. Hutton's Dynamics, the whole.
12. Waud's Analytical Geometry, chapters 7 and 8.
13. Hall's Differential Calculus, chapters 8, 9, 10, 11 and 12.
14. Composition.
15. Drawing and Surveying.

2*nd Division.*

1. Hall's Differential Calculus, chapters 1, 2 and 3.
2. Hutton's Statics, the whole.
3. Waud, the first 5 chapters.
4. Prem Sagur, 100 pages.

2*nd English Class,* 14 *Pupils.*

1. Richardson's Selections, Macbeth, Othello and Lear.
2. Bacon's Essays, the whole.
3. Tytler's Universal History, the two last volumes.
4. Elphinstone's India, the 2nd volume.
5. Abercrombie's Intellectual Powers, to the end.
6. Ditto Moral Feelings, the whole.
7. Wayland's Political Economy, to the end.
8. Natural Philosophy, L. W. K., Hydrostatics, Pneumatics and Optics in the Introduction to Natural Philosophy.
9. Bridge's Algebra to the end.
10. Snowball's Plane Trigonometry, the whole.
11. Playfair's Geometry, Book 3rd, Supplement.
12. Composition and Translation.
13. Drawing.
14. Prem Sagur, 150 pages.

3rd English Class, 13 *Pupils.*

1. Goldsmith's History of England, to the end.
2. Tytler's Universal History, two 1st Books.
3. Richardson's Selections, Cato, 1st and 2nd Books of Milton.
4. Machanics, L. W. K., 2nd part.
5. Physical Geography, L. W. K., the whole.
6. Bridge's Algebra, Quadratic Equations.
7. Snowball's Trigonometry, 3 chapters.
8. Playfair's Geometry, 6th and 11th Books.
9. Abercrombie's Intellectual Powers.
10. Composition and Translation.
11. Drawing.
12. Prem Sagur, 100 pages.

4th English Class, 19 *Pupils.*

1. Goldsmith's History of England, 210 pages.
2. Poetical Reader, No. 3, 100 pages.
3. Introduction to Natural Philosophy, Mechanics, 60 pages.
4. Bridge's Algebra, as far as Simple Equations.
5. Playfair's Geometry, to 20th Proposition of 3rd Book.
6. Translation and Drawing.
7. Woodbridge's Geography.
8. Bytal Pucheesee, the whole.

5th English Class, 34 *Pupils.*

1. Marshman's Brief Survey of History, part 1st, half.
2. Azimghur Reader.
3. Poetical Reader, No. 1, to the end.
4. Clift's Geography, ditto.
5. Lennie's Grammar, to be revised.
6. Geometry, 1st Book, 25 Propositions.
7. Translation and Writing from Dictation.
8. English Writing.
9. Goolistan in Oordoo, to the end.
10. Arithmetic to Reduction of Vulgar Fractions, inclusive.

6th English Class, 31 *Pupils.*

1. English Reader, No. 4, the whole.
2. Poetical Reader, No. 1, chapter 2nd.
3. Wollaston's Grammar, as far as Syntax.
4. Clift's Geography as far as Asia.
5. Bonnycastle's Arithmetic to Compound Division.
6. Oordoo Goolistan, the whole.
7. Dictation.
8. Oordoo and English Writing.

7th English Class, 32 Pupils.

1. Prose Reader, No. 2nd, 4 chapters.
2. Ditto do. No. 3rd, the whole.
3. Wollaston's Grammar, Etymology.
4. Arithmetic as far as Simple Division.
5. Oordoo Goolistan, chapters 3rd, 4th and 5th.

8th English Class, 24 Pupils.

1. Prose Reader, No. 2, the whole.
2. Ditto do. No. 3, the whole.
3. Goolistan in Oordoo, the whole.
4. Arithmetic as far as Simple Division.
5. Wollaston's Grammar.
6. English and Persian Copy Writing.

9th English Class, 9 Pupils.

1. Prose Reader, No. 1, the whole.
2. Ditto do. No. 2, Chapter 2.
3. Wollaston's Grammar, 12 pages, the parts of speech.
4. Arithmetic, Simple Addition.
5. Oordoo Goolistan, 1 chapter.
6. Oordoo and English Writing,

10th English Class, 17 Pupils.

1. Spelling.
2. Reader, No. 1.
3. Spelling in Oordoo.

DEHLIE COLLEGE: 1st *March*, 1850. (Signed) A. SPRENGER, *Principal.*

Course of Study proposed to be followed in the Dehlie College, during the year 1850.

1st Arabic Class, 7 Pupils.

1. Hidayah, from Babool Tahaluf to Bab ahaia vu Umvat, 200 pages.
2. Touzeeh, from beginning to Muqadamat Arbah, 235 pages.
3. Dewan Mootenabbee, from Radeef Dal to page 200.
4. Abulfedas' History, first volume.
5. Prem Sagur, 100 pages.

2nd Arabic Class, 1st Division, 6 Pupils.

1. Qodooree, from Kitabool Waqf, to the end.
2. Maqamat-i-Hareeri, from the 31st Maqam, to the end.
3. Qootbee, from beginning to Tasdeeqat, 186 pages.
4. Shurhu-Vuqayah, from beginning 52 pages.

5. Abulfedas' History, first volume.
6. Prem Sagur, 100 pages.

2nd Division, 8 *Pupils*.

1. Qutbi, to Tasawwarat inclusive, 186 pages.
2. Qodooree, 125 pages.
3. Maqamat-i-Hareeri, 30 Makams.
4. Prem Sagur, 100 pages.

3rd Arabic Class, 1st Division, 8 *Pupils*.

1. Kafiyah, the whole.
2. Sharh Moolla Bahsi Hurf.
3. Esa Ghozee, the whole.
4. Kala-ooqool, the whole.
5. Mirqat, the whole.
6. Kaleela-wa-Dumna, 100 pages.
7. Bytal Pucheesee, 1st half.

2nd Division, 3 *Pupils*.

1. Munshaib, the whole.
2. Surf Meer, ditto.
3. Bytal Pucheesee, 1st half.

1st Shea Class, 4 *Pupils*.

1. Sharh Loma, 100 pages.
2. Mala-mal-oosool, 60 pages.
3. Dewan Mootenabbee, 100 pages.
4. Prem Sagur, 100 pages.

2nd Division, 6 *Pupils*.

1. Shartool Islam, 311 pages.
2. Qootbee, from beginning to Tasdeeqat.
3. Nafhatool-Yamun, 331 pages.
4. Prem Sagur, 100 pages.

3rd Division, 5 *Pupils*.

1. Sharh Moolla, from Bahus of Fail, to the end.
2. Nafhatool-Yamun, 201 pages.
3. Bidaya, from Kitabool Sulwat to Kitabool Teza.
4. Kala-ooqool, the whole.
5. Bytal Pucheesee, first half.

4th Division, 3 *Pupils*.

1. Muntikhibat Arbi, from page 50 to 107.
2. Hidayat-ul-nahv, the whole.
3. Kafiyah, 28 pages.
4. Bytal Pucheesee, first half.

1st Persian Class, 1st Division, 6 *Pupils*.

1. Qusayed Khaqanee, 100 pages.
2. Toqiati Kisra, the whole.

2nd Division, 13 *Pupils.*

1. Deewani Nasir Ali, the whole.
2. Meena Bazar, the whole.
3. Punj Rooqa, the whole.
4. Seh Nusr Zohooree, the whole.
5. Bytal Pucheesee.

2nd Persian Class, 12 *Pupils.*

1. Sikundernamah, the whole.
2. Aboolfuzl, from Namah Kashghur to the end of 2d Chapter.
3. Bytal Pucheesee, 50 pages.

2nd Division, 8 *Pupils.*

1. Sikundernamah, half.
2. Bahar Danish, 150 pages.
3. Bytal Pucheesee, 50 pages.

3rd Persian Class, 7 *Pupils.*

1. Masnavee Ghuneemut, the whole.
2. Bahar Danish, the whole.
3. Bytal Pucheesee, 50 pages.

1st Sanscrit Class, 6 *Pupils.*

1. Sidhant Kowmdi Tudunt tavun.
2. Ottar Ram Churitr, the whole.
3. Manorum Bhag 2nd, 322 pages.
4. Mitakshara, 240 pages.
5. Rast Rangnee, 50 pages.
6. Kavya Puridcep, 200 pages.
7. Amarkosh, the whole to be revised.
8. Translation from Ramayun into Oordoo.
9. Composition into Oordoo,
10. Dewan in Oordoo, 50 pages.

2nd Sanscrit Class, 1st Division, 5 *Pupils.*

1. Sidhant Kowmdi Tudunt tavun.
2. Bhutti Kavya, 8 chapters.
3. Amurkosh, from chapter 2nd, the whole.
4. Chahar Durwesh, 3rd Durwesh.
5. Amudnamah, the whole.
6. Dewan in Oordoo, 50 pages.

3rd Sanscrit Class, 1st Division, 4 *Pupils.*

1. Mudh Koumudi, 200 pages
2. Rughovunsh, 60 pages.
3. Prikash Chundrika, 80 pages.
4. Goolistan in Oordoo, the whole.
5. Chahar Durwesh.

2nd Division, 3 Pupils.

1. Laghu Kowmdi, the whole.
2. Rughovunsh, 4 chapters.
3. Amurkosh, the whole.
4. Chahar Durwesh, 25 pages.
5. Amadnamah, the whole.

SCIENCES IN THE ORIENTAL DEPARTMENT,

AND SUCH HISTORICAL STUDIES AS ARE TAUGHT BY THE MASTER OF SCIENCES.

1st Class.

1. Differential Calculus, the whole.
2. Hutton's Dynamics, the whole.
3. Waud's Analytical Geometry to the Parabola, 149 pages.
4. Practical Geometry.

2nd Class.

1. Hutton's Statics, 49 pages.
2. Algebra, the whole.
3. History of England, the whole.

3rd Class.

1. Plane Trigonometry, both geometrically and analytically.
2. Algebra to the summation of infinite series.
3. Introduction to Natural Philosophy, Mechanics and Astronomy.
4. History of England, 200 pages.

4th Class.

1. Euclid, 11th and 12th Books.
2. Introduction to Natural Philosophy, Mechanics and Astronomy.
3. History of the Mogul Empire, the whole.
4. Arithmetic.

5th Class.

1. Euclid, 3rd, 4th and 6th Books.
2. Introduction to Natural Philosophy, Mechanics and Astronomy.
3. History of the Mogul Empire, the whole.
4. Arithmetic.

6th Class.

1. Euclid, 1st Book.
2. Geography, Asia.
3. Arithmetic.

DEHLIE COLLEGE: *The 1st March, 1850.* (Signed) A. SPRENGER, *Principal.*

BENARES COLLEGE.

Course of Studies to be pursued by the Students of the Benares College, during the Session 1850.

Class.	Senior English Department.		
	Literature.	*Science.*	:NT.
First Class, First Section, Senior Department, 3 Boys.	Shakespeare's "Julius Cæsar" (whole). Whewell's History of the Inductive Sciences, part of, (if not the whole). Norton's Rudimentals, from the 3rd discourse to the end. Macaulay's History of England, Volume I, (whole). Warren's Select Extracts from Blackstone, (whole). Abercrombie's Intellectual Powers, from the beginning to the 107th page. Thornton's Chapters on British India, from the beginning to the end of the Nipal War. Mill's Logic, part of	Geometry, (C. E. C), first 6th and 11th Books, and Quadrature of the Circle. Algebra, (C. E. C) to Quadratic Equations. Mensuration of Surfaces, (Pract. Matt. part 1), first 20 Problems. Differential and Integral Calculus, (Ritchie, part 1st). Introduction to Optics, (whole). Herschell's Astronomy, from the beginning to the 106th page.	Oordoo, Fisaneh-i Ajaib. Persian, Goolistan. Sanscrit, Hitoopdesha.

First Class, 2nd Section, Senior Department, 6 Boys.	History of England, (Keightley), Vol. I., from the reign of William II. to the end of the reign of Edward II. History of England, (Keightley), Vol II., the reigns of James I. and Charles I. Thornton's Chapters on British India, from the beginning to the end of the Nepal War. Shakspeare's "Macbeth," (whole). Warren's Select Extracts from Blackstone, first 94 pages.	Plane Geometry, (C. E. C.), 1st 6 books. Algebra, (C. E. C.) to Quadratic Equations. Introduction to Optics, whole. Reid's Chemistry, (C. E. C.) first 50 pages. Lessons on Reasoning, first two parts. Herschell's Astronomy, from the beginning to the 106th page.	Oordoo, Fisanai Ajaib. Persian, Goolistan. Sanscrit, Hitopdesha.
2nd Class, Senior Department, 10 Boys.	Shakspeare's "Macbeth" (whole). History of England, (Keightley,) Vol. I., from the reign of William II. to the end of the reign of Edward II. Lardner's History of Rome, 125 pages. Lectures on the History of India.	Hydrostatics (C. E. C.), whole. Plane Geometry, (C. E. C.), first 6 books. Algebra, (C. E C.) to Quadratic Equations. Reid's Chemistry, (C. E C.), 50 pages. Herschell's Astronomy, from the beginning to the 106th page.	Oordoo, Fisanai Ajaib. Persian, Goolistan. Sanscrit, Hitopdesha.
3rd Class, Senior Department 17 boys.	Shakspeare's "Macbeth," 1st and 2d Act. History of England, (Keightley), Vol. I, from the beginning to the end of the reign of Edward II. Lardner's History of Rome, first 96 pages.	Matter and Motion, (C. E. C.), whole. Plane Geometry, (C. E. C.)., first 2d Books. Algebra, (C. E. C.), to Fractions. Arithmetic, (C. E. C), Vulgar and Decimal Fractions. Involution, Evolution and Proportion.	Oordoo, Fisanai Ajaib and Bagh-o-Bahar. Persian, Goolistan, Resala Abdool Vusaye and Zoobdut-ool Qawaneen. Hindi, Ramayan. Sanscrit, Hitopdesha and Balbodh.

BENARES COLLEGE :
The 28th June, 1850.

(Signed) J. R. BALLANTYNE,
Secy. L. C. P. I.

Course of Studies expected to be gone through by the Arabic and Persian Departments of the Benares College, during the Session 1850.

Classes.	*Literature.*	*Science.*
First Arabic Class, 1 Boy.	Deewan Mootnabbe, from 50 to 100 pages. Hamdoollah, first 50 pages. History of India, (Marshman's) from 106 to 153 pages.	Hedaya, from 25 to 75 pages. Geography, the description of Africa and America. Algebra, (Ram Chunder's), from 300 to 400 pages. Optics, the whole. Trigonometry, (Ram Chunder's), from 40 to 100 pages. Political Economy, first 50 pages.
Second Arabic Class, 2 Boys.	Mookamat Hareeri, first 39 pages. Talkhees, first 34 pages. Tahzeeb, (the whole) History of India, (Marshman's) from 106 to 137 pages.	Shara Vuqaya, first 50 pages. Seraya, the whole. Geometry, first 3 Books. Algebra, (Ram Chunder's), to Simple Equations. Optics, 49 pages. Geography, the description of Africa. Political Economy, first 50 pages.
Third Arabic Class, 3 Boys.	Mookamat Hindee, (the whole). Kala-ooqool (the whole). Kafia, first 50 pages History of India, (Marshman's), from 106 to 153 pages.	Geography, the description of Africa and America. Algebra, (Ram Chunder's) from 300 to 400 pages. Optics, the whole. Trigonometry, (Ram Chunder's), from 40 to 100 pages. Political Economy, first 50 pages.

First Persian Class, 4 Boys.	Sekunder Nama, 79 pages. Minabazar, the whole. Hudaeq-ool Bulaghat, 38 pages. Resala Kubra, the whole. Shujratul Amani, the whole. Fusul Akbari, 30 pages. Sairool Mutakharin, Chapter II. 50 pages.	Geography, the description of Europe. Geometry, first Book. Algebra, (Ram Chnnder's), to the greatest common measure.
Second Persian Class, 11 Boys.	Anwar Sohyli, from 19 to 69 pages. Dewan i-Asufee, 50 pages. Sarf Meer, the whole. Shijratool Amani, the whole, Sair-ool-Mutakharin, from 131 to 161 pages.	Geography, the description of Asia. Arithmetic, Decimal Fractions. Geometry, first Book.

BENARES COLLEGE :
The 28th June, 1850.

(Signed) J. R. BALLANTYNE,
Secy. L. C. P. I.

Course of Studies to be pursued by the Anglo-Sanscrit Class of Pundits of the Benares College, during the Session 1850.

Literature.	*Science.*
Goldsmith's History of England, from the beginning to 400 pages. Bacon's Novum Organon.	Dr. Ballantyne's first four "Lectures on the sub-divisions of Knowledge." Harris's Dialogue concerning Art.

BENARES COLLEGE :
The 28th June, 1850.

(Signed) J. R. BALLANTYNE,
Secy. L. C. P. I.

QUESTIONS IN GIBBON'S ROMAN EMPIRE PROPOSED TO THE SENIOR ENGLISH CLASS IN THE AGRA COLLEGE, AND ANSWERS BY KUNHYA LALL.

QUESTION. Give an account of Justin the Elder's rise to power; how was he fitted to wield the imperial sceptre?

ANSWER. Justin the Elder, the uncle of Justinian, with three of his companions, left the profession of husbandman, and from his native country of Dacia, took the road to Constantinople. These peasants were enrolled in the guards of the Emperor Leo. Within the space of fifty years the fortunate Justin emerged to wealth and honor, attained the rank of count, tribune and senator, successively, and at last became captain of the guards. When the Emperor Anastasius was removed from the world, the eunuch Amantius resolved to place the diadem on the head of one of his most obsequious creatures; and in order to conciliate the suffrages of the guards, large sums of money were entrusted in the hands of their commander. These weighty arguments were treacherously employed by Justin in his own favor, and as no competitor presumed to appear, the Dacian peasant was invested with the purple. The rank of captain of the guards, and his being a good soldier did not qualify Justin for the throne. He was an illiterate monarch, and the business of the state was transacted by the Quœstor Proclus. Justin ascended the throne at the age of 68 years, and was unfit for wielding the imperial sceptre.

Q. Sketch the early life of Theodora; what was her character, and how did her influence over Justinian affect the welfare of the Roman Empire?

A. Theodora was the daughter of Acacius, a person employed by the Green Faction to take care of their beasts, in the time of the Emperor Anastasius. She had two other sisters, viz., Comito and Anastasia. Acacius died while they were young, and on a solemn festival the three daughters, dressed in the garb of suppliants, were sent by their indigent mother, to the theatre. The Greens received them with contempt; the Blues with compassion. Theodora was skilled in the pantomimic art, but neither sung nor danced, nor played upon the flute, in the theatre. Her features were delicate, and her complexion pale though somewhat tinged with a natural color. It was said by her lovers, that painting or poetry was incapable of delineating the matchless excellence of her form. She remained for about five years as a prostitute in Constantinople. At last Ecebolis, a native of Tyre, who obtained the command of the African Pentapolis, took her as a concubine; but he soon abandoned her; she then dreamt, that she was about to become the

spouse of a potent monarch, and from this time began to support herself by spinning wool; till she was at last married to the Emperor Justinian. She had some good qualities, and possessed a firm and undaunted mind. Her name is found in all the charitable institutions of the Emperor Justinian, and she maintained at a palace near the Bosphorus about 500 destitute women. The influence which she had over Justinian injured in some degree the welfare of the Roman Empire. When she became Queen she caused all her former enemies to be punished. A senator who had injured her previously to her accession was apprehended, and delivered to the executioner, to whom Theodora said "take care do not fail in the execution of my commands; otherwise know that you shall be flayed alive." The Green Faction was persecuted through her influence, and the Blues favored, while all who provoked her were punished.

Q. Describe the state of the Roman Empire under Justinian.

A. The Roman Empire under Justinian was not in a flourishing condition. Though its limits were extended by the victories of Belisarius and Narses, yet there was no good system of Government maintained in the provinces. The agriculture, manufactures, and commerce of some provinces, were in a prosperous condition. Egypt supplied Constantinople with wheat, and Sidon with manufactured articles. Silk was imported by the Persian merchants; but afterwards the silk-worms were introduced from China by the Persian monks, and the Romans themselves became its manufacturers. The revenues of Justinian were found inadequate to his expences; they were lavished in alms, buildings, ambitious wars, and ignominious treaties. Justinian obtained the good will of the people by abolishing the gold of affliction, a kind of tax gathered from the industry of the poor. Justinian was so profuse that he could not be generous. He stopped the pensions of the senators; abolished the nocturnal illuminations of the city; did not give the five yearly donatives to the armies. If any province was ravaged by the barbarians, he would not grant it the remission of a single year's taxation, as had been the custom of his predecessors. The taxes on the husbandmen, in his time, were so heavy that they fled from their villages and left the ground uncultivated. The annonâ, a kind of tribute from the husbandmen, was a supply of corn for the army. The aërial tribute was a gift of £120,000, which Justinian received from his prætorian præfects. He granted monopolies to the principal servants of the state, and allowed the sale of honors and offices. The empire throughout its whole frontier was by him strongly fortified. From Belgrade to the Euxine and from the conflux of the Save to the mouth of the Danube, he constructed four score fortified places, against the attacks of the barbarians, who in defiance of all this, yearly attacked his dominions, pillaged the country, ruined the fortresses, and carried away a great number of his subjects prisoners. To the east he constructed the fortifications of Dara, against

the Persian Kings. The empire contained 64 provinces and 935 cities, and notwithstanding all the vigilance of Justinian was often involved in wars with the barbarians. Justinian framed a body of laws for the welfare of his subjects.

Q. Who was Belisarius? mention some of his great exploits; and state how he was rewarded by the Emperor.

A. Belisarius was one of the most celebrated generals of the Roman Empire, in the time of Justinian. He was born and educated among the Thracian peasants; in his youth he was appointed a guard to the Emperor Justinian, but afterwards he was promoted to military command. His first exploit was the defeat of the Persians. But his greatest exploits were the conquests of the Vandals and the Goths; he led in chains, Gelimer and Vitiges to the foot of the throne of Justinian. When he was appointed general of the Roman army against the Vandals, he in about three months reached Africa, defeated the Vandals in the first battle in which Ammatus, and Gibamund, the nephew and brother of Gelimer the Vandal king were slain, and afterwards defeated Gelimer himself in the field of Bulla; after this he made Gelimer a prisoner, sat on the throne of the Vandal king, in Carthage, and returned in triumph to Constantinople. When he invaded Italy, Theodatus was the king of the Goths. This king, being accused of cowardice, was superseded by Vitiges, the brave general of the Goths. Rome was at first evacuated by the Goths, and Belisarius took possession of it; but Vitiges, a few days after, laid siege to it, and Belisarius made a most vigorous defence and saved the city from ruin. When the Goths retired from the siege and went to Ravena, Belisarius issued from the city, laid siege to Ravena, captured it, and made Vitiges a prisoner. After this he returned again to Constantinople. When Totila raised an insurrection in Italy, Belisarius was again sent from Constantinople; he overcame Totila, and perhaps would have annihilated his power, had he not been called home by the envy of Justinian. In the year 559 when the Bulgarians made a descent upon the empire, Belisarius was again called upon to defend it. He defeated the barbarians with a handful of soldiers, and saved the empire from ruin, and never fought an engagement, in which he was not victorious. The Emperor did not reward him well; in the end of his life, he was falsely accused of a conspiracy, deprived of his fortune, and confined to his palace for about six months. He soon after died of a broken heart, having been reduced to great poverty in his old age. "Give a penny to Belisarius the general," has been a fiction of latter times.

Q. Give the character of Justinian.

A. The Emperor was easy of access, patient of hearing, affable and courteous in his discourse; he was free from those passions that

rage in the breasts of tyrants. He was chaste, and temperate; he professed himself a lawyer, a theologian, a musician, and an architect. He had a keen penetration and a sound judgment, and discovered the talents of Belisarius in the camp, and of Narses in the palace. The love of fame was implanted in his breast, but he was possessed by a cold ambition, like Phillip II. of Spain who delighted in war, but declined the dangers of the field.

Q. Describe the first attempts of Mahomed to introduce his religion among his countrymen.

A. Mahomed at first converted his friends, his slaves and his wife, to his religion; then he proceeded to preach it to his countrymen. The Koreish offered the most strenuous resistance, and prepared to take his life. He fled to Medina, and was there favorably received as the prince of that city; for the people of Medina, when they had come to Mecca previously, in order to perform their pilgrimage to the Caaba, had heard of the orations of Mahomed, and were converted in their hearts to his religion. They therefore obeyed him as their king, honored him as their lord, and received his instructions as a prophet. The Koreish who were very much enraged against him sent their men in search of Mahomed himself and his companions who had fled to Ethiopia, but their ambassadors all returned after an unsuccessful search. When Abu Soophian, the chief of the Koreish tribe led a caravan of camels from Syria: Mahomed having heard of this, prepared to intercept him. The band of Mahomed, at this time consisted of 350 men; that of Abu Soophian of 950: a battle ensued on the plains of Ohud, in which Mahomed was victorious: soon afterwards Abu Soophian brought together an army of three thousand men, and fought another battle at Bedar, in which also Mahomed was victorious. Afterwards Abu Soophian laid siege to Medina, but in vain. This last expedition has been termed the "nations" and the "ditches," from the Arabian tribes or nations that marched under the standard of Abu Soophian, and the ditch that was drawn around the city of Medina. Mahomed had, at the very beginning, taken Alee the son of Abu Talib, into his friendship, and this man assisted him greatly in the execution of his designs. At last, after seven years, Mecca submitted to the prophet; and Caled, Amron, and Abdoollah, who afterwards proved the most faithful champions of Islam also submitted to him. When he returned to Mecca, Caled murdered about 28 men and women, for which he was severely upbraided by Mahomed who granted mercy and protection to all the people of Mecca, and forgot their former indignities. Such were the first attempts of Mahomed to propagate his faith.

QUESTIONS IN HUME'S HISTORY OF ENGLAND, PROPOSED TO THE SENIOR ENGLISH CLASS IN THE AGRA COLLEGE, AND ANSWERS BY A. SHARPLEY.

QUESTION. Sketch Wolsey's rise to power, and explain the causes that led to his downfal.

ANSWER. Wolsey was the son of a gentleman of Ipswich, and was sent to College so early that he became Bachelor (of Arts) at the age of 14. He became tutor to the Earl of Devon's children by whom he was made rector of Lincoln, and introduced to King Henry VII., and by him made his chaplain. Once the king sent him on an embassy to Ferdinand, King of the Netherlands, who was then at Brussels, in order to negotiate the King's intended marriage with Margaret of Savoy, Ferdinand's daughter. Three days after Henry was surprised on seeing Wolsey, and reproached him for delaying his departure so long, when he was told the embassy had been successfully accomplished. The King then said that he had omitted something in his instructions, and had sent a messenger after him. Wolsey replied he had reflected on the omission, and had taken it on himself to supply it. His dispatch on this occasion raised him in the opinion of Henry VII., who, but for his sudden death, would have advanced him in dignity. On the accession of Henry VIII., there were two competitors for the King's favor, Fox Bishop of Lincoln, and the Earl of Surrey. Fox was losing favor daily, when, in order to restore himself, he introduced Wolsey, thinking that he would be subservient to himself. Wolsey by encouraging Henry in his pleasures, and taking the weight of public business on his own shoulders, thus relieving Henry, who was inclined to be indolent, won so much on his favor that he cut out both Surrey and Fox; the latter of whom died soon after through disappointment. Wolsey was now at the head of the administration, and shewed himself a man of insatiable avarice, but of still greater magnificence; of extensive capacity, but of still more unbounded ambition; fond of power, but still more covetous of glory; insinuating, engaging, and persuasive; haughty to his equals but affable to his dependants; a firm patron of learning and learned men. His fall was brought about by his lukewarmness in the affair of Henry's divorce from Catharine. He served two masters, the Pope and Henry; his connection with the former was stronger than with the latter; "he held to the one and rejected the other," pretending an entire obedience to the canon laws; he suffered Compegio the Pope's legate to superintend in the trial of the legality of Henry's marriage, and made no effort to procure the divorce. He died of a broken heart at Winchester on his way to the tower: his last words being "had I but served my God as faithfully as I served the "King, he would not have forsaken me in my old age; trust not in "Princes nor in the help of men."

Q. What were the causes that led Henry to cast off the papal yoke, and what effect had this on the religion of England?

A. The exercise of power is sweet to man. The Pope held supreme authority over the minds of men; it was partly to obtain this power, but principally to seize on the lands and revenues of the monasteries, which amounted to a third of the revenue yielded by all England that led King Henry to favor the Reformation. It is probable that Henry would not have attempted such an enterprize as the rejection of the Pope's authority in England, had it not been for the Pope's conduct in the affair of the divorce of Catharine of Aragon, sister to Ferdinand of Spain, and aunt to Charles, afterwards King of Spain and Emperor of Germany. She had been married to Arthur, eldest son of Henry VII. of England, but the Prince dying soon after marriage, a bull, or dispensation, was obtained from Julius II. for her marriage with Henry. After some years Henry feeling, as he affirmed, some qualms of conscience as to the legality of the marriage, applied to Pope (Clement VII.) for a divorce; the Pope hesitated between the threats and power of Charles V., and the fear of losing the jurisdiction of England, the fairest jewel of the papal crown; but present terror at length acquired the ascendancy, and he absolutely refused the bull of divorce. Henry enraged, instantly married Anne Boleyn, and in opposition to the papal pretensions, declared himself head of the Church. The Pope never after, (not even in the time of the bigotted Mary,) recovered his authority, and England was for ever severed from the papal tiara.

Q. What was there in the relative positions of the King, the Barons, and the people, that enabled Henry to exercise such despotic power?

A. In the person of Henry were united the rival claims of York and Lancaster, his father being of the house of Lancaster and his mother Elizabeth, daughter of Edward V., head of the York faction. The Barons harassed by the quarrels between the two families, impoverished, broken in power, and divided among themselves, were unable to do any thing which might tend to Henry's hurt, and were glad to have quiet at any cost. The people long ground down by the oppressive tyranny of the Barons, from whose authority they had freed themselves, and rising in riches by commerce, clung to Henry for protection, wishing rather to be governed by one master, though a tyrant, than by many. Thus Henry possessed unresisted authority over all classes of people.

Q. Give an account of the great mechanical discovery that took place during this reign; what influence had it on the spread of literature and the progress of the Reformation.

A. The art of printing was discovered in the reign of Henry VIII., 1521. This art, which led to such momentous results, was first

invented in Germany by Dr. Faust; he was carving his name on a piece of the bark of a tree, and throwing it on the ground saw a similar, but reversed impression on the dust; this suggested the thought that it might be applied to the printing of books. He struck off many copies of the Bible, and sold them at Paris much cheaper than manuscript ones could be written; this circumstance, together with the exact resemblance of all the copies, induced the people to think that the devil assisted him. His house was broken open by the Magistrate, and the unsold copies were found in a heap, and it was not till he had revealed the art, that he could convince them that the devil had no hand in their production. Books were soon multiplied; numerous copies of the Bible published and rendered cheaper; the poorer people could now procure them: thus knowledge increased and literature extended her influence. Men's eyes were opened to the absurdities and impostures of the Bishop of Rome; the works of Luther and other reformers were distributed and read, and the reformation thus spread.

Q. Who were Elizabeth's principal favorites; and what was the character of that Princess?

A. The principal favorites of Elizabeth were Dudley, Earl of Leicester, the young Earl of Essex, and perhaps Sir Walter Raleigh; Cecil, Lord Burleigh, and Walsingham, Secretary of State, stood high in her opinion. Elizabeth was well versed in literature, and mistress of the Greek and Latin languages; fearless in the midst of danger, resolute, penetrating, possessing a mind capable of forming great designs, and a resolution to execute them; but on the other hand imperious in her tone, proud, passionate, vain of her beauty (of which she possessed but little) jealous, amorous, but having a perfect command over her desires and inclinations. As a Queen she is deserving of our praise and admiration; but as a woman, due allowance must be made for the frailties of her sex.

Q. Sketch the History of the gunpowder plot.

A. On the accession of James I. to the throne of England, the English Catholics expected that the son of such a staunch Catholic, as Mary, Queen of Scots, would treat them with more favor than they had hitherto experienced; but on James' accession he declared that he would execute the laws most vigorously against them, and show them no favor or mercy. This enraged them; and Catesby, Percy, Winter, Sir Evered Digby, and several others, in all twenty, pledged themselves most solemnly to destroy the King and Parliament; with this intention they hired a room adjoining the Parliament house, purposing to dig a mine below that place. On breaking through the wall (seven feet thick) they found a vault containing coals which were selling off; buying up the remainder, they hired the vault in the name of Percy, and in it laid a great quantity of gunpowder, and an Irish Captain, Guy Fawkes,

undertook to fire it off when the King, the Prince, and the Lords and Commons should be assembled Sir Evered Digby was to seize the Princess Elizabeth, then a child, and proclaiming her Queen, the conspirators were to rule in her name, thus the whole Parliament was doomed to destruction ; but what pity could not prevent, private friendship betrayed. Percy wrote a letter to Lord Mounteagle, requesting him not to attend the Parliament, that they should receive a sudden blow from an unknown hand ; that nobleman showed the note to the Earl of Salisbury, Chamberlain, who laid it before the King in Council. The King conjectured it to be a gunpowder plot, and advised them to search the vaults beneath Parliament house; on doing which they discovered Guy Fawkes with a dark lantern and matches in his hand, and saw the heaps of powder covered with fagots. Being put to the rack, Fawkes made a disclosure of his accomplices, who all eventually received the death they so well merited.

Questions in the "Midsummer-nights' Dream" and "Hamlet," proposed to the Senior English Class, Agra College, and answers by A. Sharpley.

Question. Where is the scene of this play laid? what kind of beings are Titania and Oberon represented as? How is Titania made to fall in love with Bottom?

What sovereign is alluded to in the lines

> "A certain aim he took
> At a fair vestal, thron'd in the west,
> And the imperial votaress passed on,
> In maiden meditation fancy free."

Answer. The scene of this play is laid first in Athens and alternately in the palace of Theseus, and in a forest in the neighbourhood of the city of Athens. Titania and Oberon are represented as Queen and King of the fairies, a diminutive race of beings holding a medium between men and angels ; that they slept is certain, for we find Titania asleep when the juice was poured into her eyes,—they seem to be merry, but subject also to human passions ; jealousy and love were shown by Oberon and Titania,—they were mortal, but lived a long time ; unlike other spirits the coming of morning did not banish them, for Oberon says to Puck,

> "I with the morning's love have oft made sport."

The juice of a flower called by the Orientals "Ishq Pécha," by Shakspeare "Love in Idleness," was poured into her eyes by Puck, which (as represented) possessed the power of causing the person, to

whose eyes it was administered, to fall in love with the next person he or she saw; which in Titania's case happened to be Bottom with an ass's head on: the virtue which the flower possessed was given to it by an arrow aimed at a damsel by Cupid, and which changed its colour from white to purple.

"A certain aim he took
At a fair vestal, thron'd in the west,
And the imperial votaress passed on,
In maiden meditation fancy free."

These lines allude to Queen Elizabeth who said to the Parliament, when pressed by them to take a husband, that she considered it her greatest glory to have for an epitaph—"here lies our Maiden Queen."

Q. Alas! poor Yorick!—I knew him, Horatio; a fellow of infinite jest, of most excellent fancy: he hath borne me on his back a thousand times, and now how abhorred in imagination it is; my gorge rises at it. There hung those lips that I have kissed I know not how oft. Where be your gibes now? Your gambols? Your songs? Not one to mock your own grinning? Quite chap-fallen? Now get you to my lady's chamber, and tell her to paint an inch thick, to this favor she must come.

HAMLET, *Act V. Scene I.*

Where and over what object was this spoken? and explain "my gorge rises at it." "Not one to mock your own grinning." "To this favor she must come."

A. This was spoken in Denmark by Hamlet over Yorick's grave, (Yorick had been the King's jester or fool) and with Yorick's skull in his hand, or perhaps with the decomposed body or skeleton lying before him. "My gorge rises at it." The gorge is the passage for the food into the stomach; when we eat any thing unusual, or when the stomach is out of order the gorge rises and ejects it; he meant to say he was ready to retch. "Not one left to mock your own grinning." This alludes to Yorick's propensity in jesting with every one he saw and mimicking their gestures. Hamlet says there was now left none to mock Yorick's grinning; his lips, together with the other fleshy parts of his body having fallen off, Yorick's bare jaws appeared to grin; grinning and showing the teeth being commonly used to signify the same action. "To this favor she must come," that is to this state, to be thus abhorred, and sickening to the sight.

Q. What is the cause of Hamlet's madness? Why does he introduce the players to act before the King? What is your idea of his character; and what fault do you find with the manner in which the play terminates?

A. I am not quite sure that he was mad; if he was it was madness with a knack in it, he feigned madness in order to deceive

his uncle. If any thing could reduce him to that state, it was the murder of his father in cold blood, and the murderer, his uncle, usurping his throne and contracting an incestuous alliance with his mother. The ghost of his father had revealed to him the circumstances of his father's death, and the name of the murderer, urging him on to vengeance. Hamlet, in order to ascertain the truth of this, and not be led away by (perhaps) the devil in his father's shape, had a play similar to that catastrophe acted before his uncle, who by subsequent behaviour betrayed himself. Hamlet seems to have been, before his father's murder, of a harmless disposition; well educated; fond of retirement; the few friends he had loved him; he was not licentious; he sued Ophelia after an honorable sort; void of inordinate ambition which 'could be bound in a nut-shell'! He was free from cruelty, which is exemplified in his abstaining so long from killing his uncle; his filial affection was shown by his mourning so long for his father, and at length undertaking to revenge his death; his rudeness to Ophelia may perhaps be a stain on his name, but it was in order to strengthen the opinion of his pretended madness. He had a fertile imagination, which he showed in the various expedients he resorted to, in order to escape detection and to save his life.

The play terminates with the death of Hamlet, Laertes, the Queen, and the King; but in order to bring about this Shakspeare causes the combatants, Laertes and Hamlet, to exchange swords during their scuffle; this exchange was a thing very unlikely to ensue, and looks rather clumsy for two such reputed swordsmen, as Hamlet and Laertes were reported to have been.

Questions in the 1st Book of "The Paradise Lost," proposed to the Senior English Class in the Agra College, and Answers by A. Sharpley.

Question. The broad circumference
Hung on his shoulders like the moon, whose orb,
Through optic glass the Tuscan artist views
At evening from the top of Fesolé,
Or in Valdarno, to descry new lands,
Rivers or mountains, on her spotted globe;
His spear to equal which the tallest pine,
Hewn on Norwegian Hills to be the mast
Of some great admiral were but a wand
He walked with, &c. &c.
Nathless he so endured, till on the beech
Of that inflamed sea he stood, and called
His legions. Angel forms, who lay entranced
Thick as autumnal leaves that strew the brooks

In Vallambrosa, or the scattered sedge
Afloat, when with fierce winds Orion armed
Has vexed the Red-sea coast, whose waves o'erthrew
Busiris and his Memphian chivalry;
While with perfidious hatred they pursued
The sojourners of Goshen.

MILTON, *Book 1st.*

Whom is this a description of? Where are Fesolé, Valdarno, Vallambrosa and Norway? What is the meaning of Optic glass? Great Admiral? Who are Busiris and his Memphian chivalry? and the sojourners of Goshen; and how were the former overthrown in the Red-sea?

ANSWER. This is a description of Satan, who approaches the lake of hell in order to rouse up his fellow angels who still lay astounded in it. Fesolé is in Tuscany; Valdarno in Italy; Norway on the N. W. of Europe; it together with Sweden on the East, from which it is separated by the Doffrafield mountains, forms a peninsula with the Arctic north; Baltic. east and south; the Atlantic west; it is to the north of Denmark. An '*Optic glass*' means a telescope. 'Admiral,' the admiral's ship, which is generally the largest in the fleet. 'Busiris,' Pharaoh king of Egypt; 'Memphian Chivalry', the army of Pharoah. I should rather say his chariot, charioteers, and horsemen. Cheval is the French for a horse; Memphis and Pharaoh are synonymous and were Patronymics. 'Sojourners of Goshen;' the children of Israel who went to Egypt, during a famine which lasted seven years, and were through the influence of Joseph, Prime Minister, placed in the fertile land of Goshen. After some years God commanded the Israelites to depart from Egypt. After repeated refusals, which caused the seven plagues, Pharaoh gave his consent. On reaching the shores of the Red Sea they saw the Egyptians in full pursuit, and cried to God for help, who parted the Red Sea for them, leaving a dry path through the midst,—they passed over by the opening, but Pharaoh and his army, attempting to follow, were overwhelmed by the waters, which returned to their former state.

QUESTIONS IN SHAKSPEARE'S HENRY THE IVTH, PROPOSED TO THE SENIOR ENGLISH CLASS IN THE AGRA COLLEGE, AND ANSWERS BY A. SHARPLEY.

QUESTION. What is your idea of the character of Falstaff? Paraphrase and explain the following passage.

"Sheris illumineth the face, which as a beacon gives warning to all the rest of this little kingdom, man to arm; and then the vital

commoners and inland petty spirits muster we all to their captain, the heart; who great and puffed up with this retinue, doth any deed of courage; and this valour comes of Sheris; so that skill in a weapon is nothing without sack, for that sets it to work; and learning, a mere hoard of gold kept by a devil, till sack commences it, and sets it in act or use; if I had a thousand sons the first human principle I would teach them should be to forswear thin potations and addict themselves to sack."

ANSWER. Falstaff, who was a highwayman in the reign of Henry IV, and the companion of Henry Prince of Wales, while he associated with low company, was a drunken sot and cared for no one as long as he had a bottle of sack; was very licentious, had a great opinion of himself, which he showed by boasting to Justice Shallow how much he could do, was possessed of a soul of wit, although it was low. A great boaster, and as most if not all boasters are, an arrant coward; never dreamt of religion, although he talked of reforming, and he instantly jumped at the idea of a robbing match. A thorough-bred liar, possessed no shame, fond of women.

Sheris illumineth the face, which as a beacon giveth warning to this little kingdom man to arm; and then the vital commoners and inland petty spirits muster we all to their captain, the heart; who great and puffed up with this retinue, doth any deed of courage; and this valour comes of Sheris, so that skill in a weapon is nothing without sack, for that sets it to work; and learning, a mere hoard of gold kept by a devil, till sack commences it, and sets it in act or use; if I had a thousand sons the first human principle I would teach them should be to forswear thin potations and addict themselves to sack. Falstaff says to Henry.

Sheris or sack (a strong Spanish liquor) lighteth up the face (makes it red, an emblem or characterestic of fire) which like to a beacon or watch fire (a signal of danger) gives warning (or notice of danger) to all the other parts of this little kingdom (or body) of man to arm or prepare for defence; and the vital commoners (or those parts of the inside of man which are necessary to existence, the arteries), and the lesser inland (or inside) petty spirits (which may mean either those other parts, the injuring of which may not be fatal, the veins, or may mean the feelings and desires which are inherent in man) all these muster to the heart, that is, send their contents (the heated blood) to the heart, which enlarged and swelled up with this assemblage or collection, dares, or is ready to undertake any action requiring valour, and this valour is produced by Sheris, so that skill in (or aptness in the use of) a weapon is of no avail without sack; for that sets it to work (gives us courage to put it to proper use) and learning is a mere hoard (or treasure heaped up) of gold or valuable treasure kept (guarded by or in the possession of) a devil, till sack commences (or puts it into action) it, and makes it do something.

Shakspeare in these words refers to the militia and beacons used in the time of Elizabeth. The militia was composed of shopkeepers and tradesmen, who are not very remarkable for their courage; the beacons were lighted along the coasts, and answering ones took up the signals on the approach of danger; the militia assembled, union gave strength, and emboldened them to acts of courage, which singly they would not have attempted.

Sack, says Falstaff, warms the blood, rouses up every latent feeling, causes the blood to course rapidly through every vein and artery, giving life and vigour to every part, and excites man with a false courage which he had not before possessed. Fear turns the blood—cold sack warms it, therefore drives out fear: this is often taken advantage of by military and naval commanders, who distribute liquor to their soldiers or sailors before a combat.

Questions in Mathematics proposed by Government to the Senior Class in the Agra College, and answers by Kunhya Lall.

Question. Find the point in the arc of a quadrant, at which the angle included between two lines, one drawn to the centre, the other to the bisection of the radius, shall be the greatest possible.

Answer. Let OAB be the given quadrant.

$$OA = a$$

$$OC = \tfrac{1}{2} a$$

and let $ON = x$, and $NP = y$

let $\angle OPC = \theta$

then $\tan \theta = \tan (OPN - CPN)$

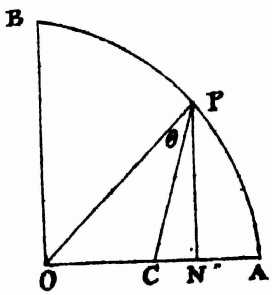
$$= \frac{\tan OPN - \tan CPN}{1 + \tan OPN \,.\, \tan CPN}$$

$$= \frac{\frac{x}{y} - \frac{x - \frac{1}{2}a}{y}}{1 + \frac{x(x - \frac{1}{2}a)}{y^2}}$$

$$= \frac{yx - yx + \frac{1}{2}ay}{y^2 + x^2 - \frac{1}{2}ax}$$

$$= \frac{\frac{1}{2}ay}{y^2 + x^2 - \frac{1}{2}ax}$$

$$= \frac{ay}{2y^2 + 2x^2 - ax}$$



Now since $\tan\theta$ is a maximum, $\frac{1}{\tan\theta}$ is a minimum, we have

$$\therefore\ u = \frac{1}{\tan\theta} = \frac{2y^2 + 2x^2 - ax}{ay}$$

$$= \frac{2y}{a} + \frac{2x^2}{ay} - \frac{x}{y}$$

$$= \frac{2\sqrt{a^2 - x^2}}{a} + \frac{2}{a} \cdot \frac{x^2}{\sqrt{a^2 - x^2}} - \frac{x}{\sqrt{a^2 - x^2}}$$

then $$\frac{du}{dx} = \frac{2}{a} \cdot \frac{-x}{\sqrt{a^2 - x^2}} + \frac{2}{a} \cdot \frac{2x\sqrt{a^2 - x^2} + \frac{x^3}{\sqrt{a^2 - x^2}}}{a^2 - x^2}$$

$$- \frac{\sqrt{a^2 - x^2} + \frac{x^2}{\sqrt{a^2 - x^2}}}{a^2 - x^2} = 0$$

or $$\frac{2}{a} \cdot \frac{2x(a^2 - x^2) + x^3}{(a^2 - x^2)^{\frac{3}{2}}} - \frac{2}{a} \cdot \frac{x}{\sqrt{a^2 - x^2}}$$

$$= \frac{a^2 - x^2 + x^2}{(a^2 - x^2)^{\frac{3}{2}}}$$

or $$\frac{2}{a} \cdot \frac{2xa^2 - x^3}{a^2 - x^2} - \frac{2}{a}x = \frac{a^2}{a^2 - x^2}$$

i. e. $$\frac{2}{a}x\left(\frac{2a^2 - x^2}{a^2 - x^2} - 1\right) = \frac{a^2}{a^2 - x^2}$$

i. e. $$\frac{2}{a}x\left(\frac{2a^2 - x^2 - a^2 + x^2}{a^2 - x^2}\right) = \frac{a^2}{a^2 - x^2}$$

or $$\frac{2}{a}x \cdot a^2 = a^2$$

i. e. $$\frac{2}{a}x = 1$$

$$\therefore\ x = \frac{a}{2}$$

and $$y = \sqrt{a^2 - x^2} = \sqrt{a^2 - \frac{a^2}{4}} = \sqrt{\frac{3}{4}a^2} = \frac{a}{2}\sqrt{3}$$

$\therefore\ x = \frac{a}{2}$ and $y = \frac{a}{2}\sqrt{3}$, and the point required is determined.

Therefore a line drawn $\perp$ from the bisection of the radius, and cutting the arc in a point, that point is the only point at which the conditions of the question will be fulfilled.

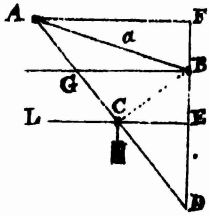
Q. To two nails given in position is attached a cord of given length, greater than the distance between the nails. Find the position of equilibrium of a given weight sliding freely on the cord.

A. Let A and B be the two nails.

Let $AB = a$, $\angle BAF = \alpha$

and length of the cord $= L$

Let the weight slide down to C, and be in equilibrium, then we have to determine CE and BE, and the position of equilibrium will be determined.



If we had the prop A in the same horizontal line with B, then $\angle$ BAC would have been equal to the angle ABC *i. e.* BCE would have been equal to GCL; we will suppose the prop from G to be removed to A, and a force added to the tension of the cord, so as not to disturb the position of C, then $\angle$ BCE would still be equal to the $\angle$ GCL

therefore the $\angle ECD = \angle BCE$

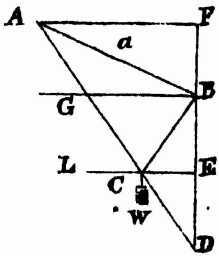
and $BE = \frac{1}{2} BD$

Now $BD = DF - FB$

$= DF - AB \text{ sine } \alpha$

$= \sqrt{L^2 - a^2 \cos^2 \alpha} - a \text{ sine } \alpha$

$$\therefore BE = \frac{\sqrt{L^2 - a^2 \cos^2 \alpha} - a \text{ sine } \alpha}{2}$$



Again, $CE : AF :: ED : FD$

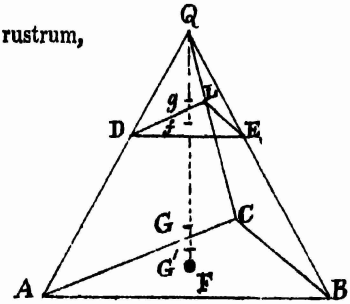
$$\text{or } CE : a \cos \alpha :: \frac{1}{2}\left(\sqrt{L^2 - a^2 \cos^2 \alpha} - a \text{ sine } \alpha\right) : \sqrt{L^2 - a^2 \cos^2 \alpha}$$

$$\therefore CE = \frac{a \cos \alpha \left(\sqrt{L^2 - a^2 \cos^2 \alpha} - a \text{ sine } \alpha\right)}{2 \sqrt{L^2 - a^2 \cos \alpha}}$$

and hence the position of equilibrium of the body is determined.

Q. Find algebraically the centre of gravity of the frustrum of a pyramid.

A. Let ABC, LFD be thef rustrum,



Let AB = a, DE = b, Ff = c, complete the pyramid, and let G be the centre of gravity of the large pyramid, and g, that of the small one, and G^1 that of the frustrum,

Let $G^1F = x$

Now the frustrum acting at G^1, and the small pyramid acting at g, balance each other on G. Then we have

$$\frac{G^1G}{gG} = \frac{\text{weight of the small pyramid}}{\text{weight of the frustrum}}$$

$$= \frac{\text{weight of the small pyramid}}{\text{weight of large pyramid—the weight of the small pyramid}}$$

$$= \frac{b^3}{a^3-b^3}$$

$$\therefore\ G^1G = gG.\ \frac{b^3}{a^3-b^3}$$

$$\text{but } gG = QG-Qg = \frac{3}{4}\ QF - \frac{3}{4}\ Qf$$

$$= \frac{3}{4}\left(QF - Qf\right)$$

$$= \frac{3}{4}\ c$$

$$\therefore\ G^1G = \frac{3}{4}\ c\ .\ \frac{b^3}{a^3-b^3}$$

$$\text{Again, } GF = \frac{1}{4}\ QF = \frac{1}{4}\ \frac{a}{a-b}\left(QF-Qf\right)$$

$$= \frac{1}{4}\ \frac{a}{a-b}\ c$$

$$\therefore x = G^1F = GF-G^1G$$

$$= \frac{1}{4}\ \frac{a}{a-b}\ c - \frac{3}{4}\ c\ .\ \frac{b^3}{a^3-b^3}$$

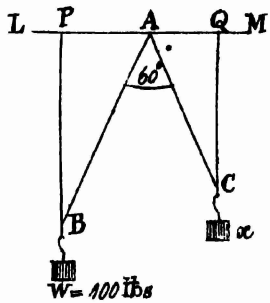
$$= \frac{1}{4} c \left\{ \frac{a}{a-b} - \frac{3b^3}{a^3-b^3} \right\}$$

$$= \frac{1}{4} c \left\{ \frac{a(a^2+ab+b^2)-3b^3}{a^3-b^3} \right\}$$

$$= \frac{1}{4} c \left\{ \frac{a^3+a^2b+ab^2-3b^3}{a^3-b^3} \right\}$$

$$= \frac{1}{4} c \left\{ \frac{a^2+2ab+3b^2}{a^2+ab+b^2} \right\}$$

Q. A bent lever, the lengths of whose arms are as 10 to 7, and the arms inclined to each other 60° is in equilibrium with the arms equally inclined to the horizon—a weight of 100lbs being attached to the extremity of the longer arm. Find the weight at the end of other.



A. Let B and C be the extremities of the given lever. Let AB = 10 feet and AC = 7 feet. Now because according to the question, the arms are equally inclined to the horizon, we have the ∠ BAP = CAQ, and ∵ ∠ BAC is 60° ∴ each of the angles BAP and CAQ is 60°.

Now as there is equilibrium

$$W \,.\, PA = x \,.\, AQ$$

$$\text{or} \quad x = W. \frac{PA}{AQ}$$

$$= W. \frac{AB}{AC}$$

$$= 100 \times \frac{10}{7} \text{lbs.}$$

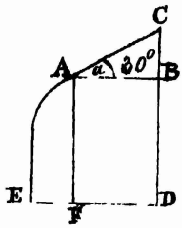
$$= 142.8 \text{lbs.}$$

∴ the required weight is 142.8lbs.

Q. A body slides off a roof inclined 30° to the horizon, and 32 feet in length—then falls to the ground, which is 60 feet below the edge of the roof—where will it alight, and what will be the time of its descent?

A. Let AC be the roof, $\angle$ BAC = 30°

AC = 32 feet.



$$\text{Now } AC = \frac{1}{2}\, g \text{ sine } \alpha\, t^2$$

$$= \frac{1}{2}\, g\, \frac{1}{2}\, t^2 \because \text{ sine } 30^\circ = \frac{1}{2}$$

$$\text{or} \quad 32 = \frac{1}{4}\, g\, t^2$$

but $g = 32.14$, rejecting the fraction; we have

$$\therefore t^2 = 4$$

$$\therefore t = 2$$

$$\text{Again, } v = g \text{ sine } \alpha\, t = g\, \frac{1}{2} \times 2 = g = 32 \text{ feet.}$$

Therefore the velocity of the body when it reaches the foot of the roof is 32 feet per second, the body after it has passed the roof falls on the ground, the path being a parabola; taking the vertical line from A as the axis of x, and the horizontal from the same point as the axis of y the equation to that parabola is

$$y^2 = \frac{2\, v^2}{g}\, x$$

where v is the velocity with which the body descends. In the present case v = 32 feet and x = 60 feet.

$$\therefore y^2 = \frac{2\, v^2}{g}\, x$$

$$= \frac{2 \times 32^2}{32} \cdot 60 \text{ feet.}$$

$$= 2 \times 32 \times 60 \text{ feet.}$$

$$= 64 \times 60 \text{ feet.}$$

$$\therefore y = 8 \sqrt{60 \text{ feet}}.$$

$$= 8 \times 7.75 \text{ feet.}$$

$$= 62{\cdot}00 \text{ feet}$$

∴ The place where the body alights is 62 feet from the point directly below that point at the bottom of the roof, from which the body falls; *i. e.* EF = 62 feet. The body falls at E.

Again from $y = v\,t$, and $x = \frac{1}{2} gt^2$ which both being combined give the equation to the projectile, we have

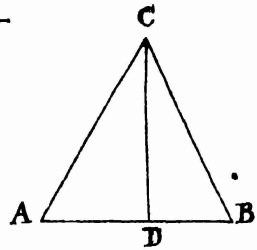
$$t = \frac{y}{v}$$

$$= \frac{62}{32} = \frac{31}{16} = 1{\cdot}9''$$

and the time of descent from the top of the roof to its edge has been found to be $2''$, therefore the whole time occupied by the body in falling from the top of the roof to the ground is $2 + 1.9'' = 3.9''$.

Q. Prove that of all triangles on the same base, and having the same altitude, the isosceles is that whose perimeter is least.

A. Let ABC be the given triangle—



$AB = a$, $CD = b$,

let $AD = x$,

then $DB = a - x$,

and $AC = \sqrt{x^2 + b^2}$

and $CB = \sqrt{(a - x)^2 + b^2}$

$$\therefore u = \sqrt{x^2 + b^2} + \sqrt{(a - x)^2 + b^2} + a = \text{minimum}$$

$$\therefore \frac{du}{dx} = \frac{x}{\sqrt{x^2 + b^2}} + \frac{a - x}{\sqrt{(a - x^2) + b^2}} = 0$$

or $x\sqrt{(a - x)^2 + b^2} = (a - x)\sqrt{x^2 + b^2}$

i. e. $x^2 (a^2 - 2\,ax + x^2 + b^2) = (a^2 - 2\,ax + x^2)\,(x^2 + b^2)$

or $a^2 x^2 - 2\,a\,x^3 + x^4 + b^2 x^2 = a^2 x^2 - 2\,ax^3 + x^4$
$\qquad + a^2 b^2 - 2\,ab^2 x + b^2 x^2$

taking away the equals from both sides, we get

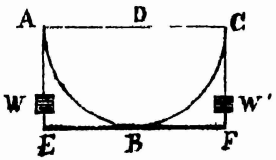
$$2\,ab^2 x = a^2 b^2$$

$$\text{or} \quad 2\,x = a$$

$$\therefore \quad x = \tfrac{1}{2} a$$

$\therefore$ AD and DB are equal, or to say the same thing, the $\triangle$ ACB is an isosceles $\triangle$. Therefore of all triangles upon the same base, and having the same or equal altitude, the isosceles has the least perimeter.

Q. A given segment of a circle is at liberty to roll on a horizontal plane. Find the position of equilibrium when two bodies in the ratio of b to c are attached to the extremities.



A. Let ABC be the given segment, and W and W^1, two weights attached to its extremities, the ratio of $W : W^1$, being $b : c$. Then as the segment is at liberty to roll upon the horizontal plane, after some oscillations it would take the position of equilibrium; let this position be as represented in the figure, and for the condition of that position we have the equation

$$W.\ BE = W^1.\ BF$$

$$\text{or } \frac{BE}{BF} = \frac{W^1}{W}$$

$$= \frac{c}{b}$$

$$\text{or } BE : BF :: c : b$$

$$i.\ e.\ BE + BF : BE :: b + c : c$$

$$\text{or } EF : BE :: b + c : c$$

$$i.\ e.\ AC : AD :: b + c : c$$

$$\therefore AD = \frac{AC \times c}{b + c}$$

$$= \frac{d \times c}{b + c} \quad \text{supposing } AC = d$$

$\therefore$ when AD is equal to $\frac{d \times c}{b + c}$ then the segment only will stop and be in equilibrium.

Q. A heavy body on a horizontal plane is dragged by three ropes—a force of 50lbs. being applied to each. Their inclinations to the horizon are 10°, 20°, and 30°, and the horizontal angles between the 1st and 2nd, 20°, and between the 2nd and 3rd, 15°. Find the Resultant, and ascertain the advantage that would be gained by applying all these forces in one direction.

A. Take the position of the heavy body as the origin of rectangular co-ordinates, and let AP_1, AP_2, AP_3, be the directions of the forces

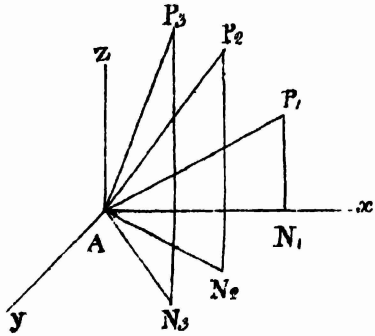
the $\angle P_1 AN_1 = 10°$

$P_2 AN_2 = 20°$

$P_3 AN_3 = 30°$

and $N^1 AN_2 = 20°$

and $N^2 AN_3 = 15°$



Here we have supposed the first force to be in the plane of x z, and consequently its projection AN_1 coinciding with the axis of x. Then the components of the first force are P_1 cos 10°, and P_1 sine 10°, in the directions of the axis of x and z, of the second force, are P_2 cos 20°, P_2 sine 20°; of the third force, are P_3 cos 30°, P_3 sine 30°. The components of the forces P_2 P_3 in the plane y x, are not in the direction of the axis of x, but are projected on that plane as showed in the figure; and they are again to be decomposed in the directions of the axis of x and y: the components then of P_2 cos 20°, are P_2 cos 20° cos 20°, and P_2 cos 20° sine 20°; and of P_3 cos 30° are P_3 cos 30° cos 35°, and P_3 cos 30° sine 35°; therefore the sum of the forces in the axis of x.

$$= P_1 \cos 10° + P_2 \cos^2 20° + P_3 \cos 30° \cos 35°$$
$$= X \text{ suppose,}$$

the sum of those in the axis of z,

$$= P_1 \text{ sine } 10° + P_2 \text{ sine } 20° + P_3 \text{ sine } 30°$$
$$= Z \text{ suppose}$$

of those in the axis of y

$$= P_2 \cos 20° \text{ sine } 20° + P_3 \cos 20° \text{ sine } 35°$$
$$= Y \text{ suppose}$$

therefore R the Resultant $= \sqrt{X^2 + Y^2 + Z^2}$

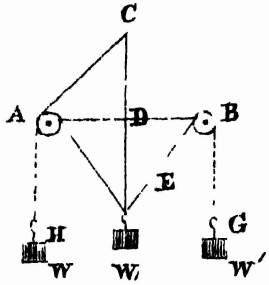
and the cosine of the angle which it makes with the axis of x

$$= \frac{X}{R}$$

If all these forces had been applied in one direction only, then their resultant would be greater perhaps, which can be ascertained only by

finding the numerical values of the resultants in both cases, which can be done with reference to the logarithmic tables.

Q. Demonstrate that a rope or chain cannot be stretched rigidly horizontal between two points.



A. Let the two points be A and B, and suppose two pulleys to be fixed there, and let GBEAH, having two equal weights W and W^1 attached to its extremeties, and another weight W_1 attached to the middle of the cord, pass over them; draw AC parallel to BE, and let DE produced meet it in the point C; then the sides of the △ ACE are proportional to the weights W_1 W_1 and W^1: and as W is taken equal to W^1, AE = AC, and therefore CE is bisected in the point D: the magnitude of the line CE or its half DE depends upon the magnitude of the weight W_1: and DE* can never become equal to zero, as long as W_1 has any magnitude; but the cord AEB has its own weight as W_1 attached to it; hence DE can never become zero, or the cord cannot be stretched rigidly horizontal. If in the place of the cord we have a rope, it will never be stretched rigidly horizontal, because it has its own weight acting downwards; the forces W and W^1 cannot stretch the cord so as to make DE = o.

> "Hence no force however great
> Can stretch a cord however fine,
> Into a horizontal line,
> Which shall be accurately straight."

Q. In what bodies is equilibrium indifferent in all positions? Mention the result and of this condition.

A. The equilibrium in all positions is indifferent in a sphere, and a solid formed by the revolution of the cycloid round its base, and a solid formed by the revolution of a cissoid round its assymptote. The consequence is that such bodies can never be applied or made use of in places, where stable equilibrium is required.

---

* $\therefore AC : 2\,DE :: W : W_1 \therefore DE = AC.\frac{W_1}{2W} = \sqrt{AD^2 + DE^2}\,\frac{W_1}{2W}$

or $DE^2 = (AD^2 + DE^2)\frac{W_1^2}{4W^2}$ *i. e.* $DE^2\left(1 - \frac{W_1^2}{4W^2}\right) = AD^2 . \frac{W_1^2}{4W^2}$

or $DE \times \frac{\sqrt{4W - W_1^2}}{2W} = AD, \frac{W_1}{2W} \therefore DE = AD\,\frac{W_1}{\sqrt{4W^2 - W_1^2}}$. hence DE cannot be o unless W_1 = o.

Q. The equation $x^3 - 5x^2 + 8x = 4$ has two equal roots. Find them.

A. The equation $x^3 - 5x^2 + 8x = 4$ has two equal roots each $= 2$. Two is the division of the last term 4, and therefore is one of the roots.

Q. Solve the equation

$$\frac{a + x + \sqrt{2ax + x^2}}{a + x} = c$$

A. Here $\dfrac{a + x + \sqrt{2ax + x^2}}{a + x} = c$

$$\text{or } 1 + \frac{\sqrt{2ax + x^2}}{a + x} = c$$

$$\text{or } \frac{\sqrt{2ax + x^2}}{a + x} = c - 1$$

$$\text{or } \frac{2ax + x^2}{(a + x)^2} = c^2 - 2c + 1$$

$$\begin{aligned}\text{or } 2ax + x^2 &= (a^2 + 2ax + x^2)(c^2 - 2c + 1)\\ &= a^2c^2 + 2ax.c^2 + c^2x^2\\ &\quad - 2a^2c - 4acx - 2c\,x^2\\ &\quad + a^2 + 2ax + x^2\end{aligned}$$

by transposition, and taking off the equals from both sides we have

$$a^2c^2 + 2axc^2 + c^2x^2 + a^2 = 2a^2c + 4acx + 2cx^2$$

$$\text{or } c^2x^2 - 2cx^2 + 2ac^2x - 4acx = 2a^2c - a^2c^2 - a^2$$

$$\text{or } (c^2 - 2c)\,x^2 + (2ac^2 - 4ac)\,x = a^2\,(2c - c^2 - 1)$$

$$i.\,e.\quad x^2 + \frac{2ac\,(c - 2)}{c.\,(c - 2)}\,x = \frac{a^2\,(2c - c^2 - 1)}{c\,(c - 2)}$$

$$i.\,e.\quad x^2 + 2\,ax = \frac{a^2\,(2c - c^2 - 1)}{c\,(c - 2)}$$

$$\text{or}\quad x^2 + 2ax + a^2 = \frac{a^2\,(2c - c^2 - 1)}{c\,(c - 2)} + a^2$$

$$= \frac{2a^2c - a^2c^2 - a^2 + a^2c^2 - 2ca^2}{c\,(c - 2)}$$

$$= -\frac{a^2}{c\,(c - 2)}$$

$$\therefore x + a = \pm a \sqrt{\frac{-1}{c(c-2)}}$$

$$\therefore \quad x = a \sqrt{\frac{-1}{c(c-2)}} - a$$

Q. Divide a given angle into two, whose tangents shall have a given ratio to each other.

A. Let 2 A be the given angle, it is required to divide it into two such parts that the tangents of these parts shall be to each other as m : n

Let $A + x$, and $A - x$ be the two parts,

then $\tan(A + x) : \tan(A - x) :: m : n$

or $n \,.\, \tan(A + x) = m.\, \tan(A = x)$

or $n \,.\, \dfrac{\text{sine}\,(A + x)}{\cos(A + x)} = m \,.\, \dfrac{\text{sine}\,(A - x)}{\cos(A - x)}$

or n sine $(A + x)$. $\cos(A - x) = m \,.\, \cos(A + x)$ sine $(A - x)$

or $2\,n$. sine $(A + x)$ $\cos(A - x) = 2\,m \,.\, \cos(A + x)$ sine $(A - x)$

i. e. n (sine $2\,A +$ sine $2\,x) = m$ (sine $2\,A -$ sine $2\,x$)

or n sine $2\,x + m$ sine $2\,x = m$ sine $2\,A - n$ sine $2\,A$

or sine $2\,x\,(m + n) =$ sine $2\,A\,(m - n)$

$$\therefore \text{sine}\, 2\,x = \frac{m - n}{m + n} .\ \text{sine}\ 2\,A$$

and $\therefore \log \text{sine}\, 2\,x = \log(m - n) + \log \text{sine}\, 2\,A - \log(m + n)$ and hence x is found, and $\therefore A + x$, and $A - x$, the required two parts are found.

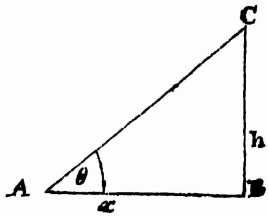
Q. Prove that $\cos . 2\,a = 2\,(\cos.\, a)^2 - 1$

A. Here $\cos 2a = \cos(A + A) = .\cos A \cos A -$ sine A sine A

$$= \cos^2 A - \text{sine}^2 A$$
$$= \cos^2 A - (1 - \cos^2 A)$$
$$= 2\cos^2 A - 1$$

Q For finding the height of an object by taking its angle of elevation from a certain distance on the horizontal plane, what should that distance be, so that any error of observation may least affect the result.

A. Let BC be any object situate



on the plane AB, AB = x,

$\angle A = \theta$, BC = h

then $h = x \tan \theta$

suppose that an error has crept into the observation, and that the angle of elevation is not θ, but $(\theta + m)$, then $x . \tan (\theta + m)$ must be the height, suppose this to be h',

then $x . \tan (\theta + m) - x . \tan \theta = h' - h$

$$\text{or } x \left\{ \tan (\theta + m) - \tan \theta \right\} = h' - h$$

$$\text{or } x \left\{ \frac{\text{sine } (\theta + m)}{\cos (\theta + m)} - \frac{\text{sine } \theta}{\cos \theta} \right\} = h' - h$$

N. B.—The writer has not completed the answer.

Q. Given the tangent of an angle, to find the tangent of twice the angle.

A. Let tan A be given, it is required to find tan 2 A. Suppose, tan A = a

$$\text{Now, because } \tan 2A = \tan (A + A) = \frac{\tan A + \tan A}{1 - \tan A \tan A}$$

$$= \frac{2 \tan A}{1 - \tan^2 A}$$

$$\text{we have } \tan 2 A = \frac{2a}{1 - a^2}$$

$$\frac{2a}{-a) (1 + a)}$$

Hence tan 2 A is found in the terms of the given quantity,

Q. Sine $(30^0 + x)$ + sine $(30^0 - x) = \frac{1}{2}$. Find x

A. Here sine $(30^0 + x)$ = sine 30^0 cos x + cos 30^0 sine x

and sine $(30^0 - x)$ = sine 30^0 cos x — cos 30^0 sine x

we have, sine $(30^0 + x)$ + sine $(30^0 - x)$ = 2 sine 30^0 cos

but by hypothesis sine $(30^0 + x)$ + sine $(30^0 - x)$ =

$$\therefore 2 \text{ sine } 30^0 \cdot \cos x = \tfrac{1}{2}$$

$$\text{or } 2 \times \tfrac{1}{2} \cdot \cos x = \tfrac{1}{2}$$

$$\text{or } \cos x = \tfrac{1}{2} = \cos 60^0$$

$$\therefore x = 60^0$$

Q. In a spherical triangle, if the sides b and c are equal, shew that

$$\text{Sine } b. = \frac{\text{sine } \frac{a}{2}}{\text{sine } \frac{A}{2}} \text{ and, sine } B = \frac{\cos \frac{A}{2}}{\cos \frac{a}{2}}$$

A. In a spherical △ whose sides are a, b, c, and the opposite angles A, B, C, we have

$$\cos A = \frac{\cos a - \cos b \cos c}{\text{sine } b \text{ sine } c}, \text{ but b is given} = c$$

$$\text{then } \cos A = \frac{\cos a - \cos^2 b}{\text{sine}^2 b}$$

$$i.\ e.\ 1 - 2 \text{ sine}^2 \tfrac{1}{2} A = \frac{\cos a = \cos^2 b}{\text{sine}^2 b}, \because \cos A = 1 -$$

$$\text{or } 2 \text{ sine}^2 \tfrac{1}{2} A = 1 - \frac{\cos a - \cos^2 b}{\text{sine}^2 b}$$

$$= \frac{\text{sine}^2 b - \cos a + \cos^2 b}{\text{sine}^2 b}$$

$$= \frac{1 - \cos a}{\text{sine}^2 b}$$

$$= \frac{2 \text{ sine}^2 \frac{1}{2} a}{\text{sine}^2 b}$$

$$\text{or sine}^2 b = \frac{2 \text{ sine}^2 \frac{1}{2} a}{2 \text{ sine}^2 \frac{1}{2} A}$$

$$= \frac{\text{sine}^2 \frac{1}{2} a}{\text{sine}^2 \frac{1}{2} A}$$

$$\therefore \text{sine } b = \frac{\text{sine } \frac{1}{2} a}{\text{sine } \frac{1}{2} A}$$

$$\text{Again, } \cos a = \frac{\cos A + \cos B \cos C}{\sin B \sin C}$$

$$= \frac{\cos A + \cos^2 B}{\sin^2 B}$$

because, when the sides b, c are equal their opposite angles are also equal;

$$\text{then } \cos a = \frac{\cos A + \cos^2 B}{\sin^2 B}$$

$$\text{or } 2\cos^2 \tfrac{1}{2} a - 1 = \frac{\cos A + \cos^2 B}{\sin^2 B}, \because \cos a = 2\cos^2 2\tfrac{1}{2} a - 1$$

$$\text{then } 2\cos^2 \tfrac{1}{2} a = \frac{\cos A + \sin^2 B + \cos^2 B}{\sin^2 B}$$

$$\text{or } 2\cos^2 \tfrac{1}{2} a = \frac{\cos A + 1}{\sin^2 B}$$

$$= \frac{2\cos^2 \tfrac{1}{2} A - 1 + 1}{\sin^2 B}$$

$$= \frac{2\cos^2 \tfrac{1}{2} A}{\sin^2 B}$$

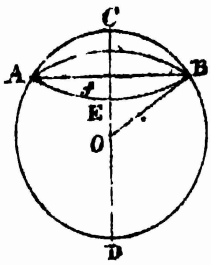
$$\text{then } \sin^2 B = \frac{2\cos^2 \tfrac{1}{2} A}{2\cos^2 \tfrac{1}{2} a}$$

$$= \frac{\cos^2 \tfrac{1}{2} A}{\cos^2 \tfrac{1}{2} a}$$

$$\therefore \sin B = \frac{\cos \tfrac{1}{2} A}{\cos \tfrac{1}{2} a}$$

Q. Supposing a portion of the Earth's convex crust to be down to form a horizontal plane, the central depth being 10 m from the original surface, what would be the extent of the plane, Earth being considered a sphere—diameter 7913 miles?

A. Here let ADBC be the Earth, OB = 3956, the plane AEB cutting a portion of the curved surface, ACB, and C f = 10 miles, required to find the area of the circle AEB, *i. e.* the extent of the horizontal plane formed after the curved surface has been cut down.



Here the area of AEB $= \pi f B^2$

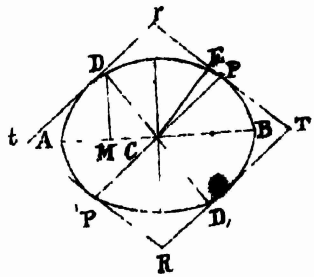
$$= \pi \left(OB^2 - Of^2\right)$$
$$= \pi (3956^2 - 3946^2)$$
$$= \pi \times 79020$$
$$= 3.14 \times 79020$$
$$= 248122.8 \text{ square miles}$$

∴ The surface of the curved portion cut off

$$= 10 \times 2\pi . 3956$$
$$= 20 \times \pi + 3956$$
$$= \pi . 79120$$
$$= 248436 \cdot 8 \text{ square miles}$$

Q. Prove that the areas of an parallelograms circumscribing an Ellipse are equal.

A. Let AP^1DB be an Ellipse, PP^1, DD^1 four points in its circumference, such that the lines PP^1DD^1 are conjugate diameters to each other, TRtr, a $\square^m$ circumscribing the Ellipse, CE ⊥ to rT and DM ⊥ to AB; 2a is the major-axis of the Ellipse, and 2b its minor axis, then if x, y be the co-ordinates of the point P, and r PT a tangent to it, CT $= \frac{a^2}{x}$ and DM the ordinate of the extremity of the diameter conjugate to $PP^1 = \frac{bx}{a}$



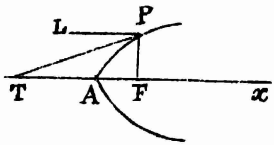
Now the whole area of the $\square$ Rr $= 4$ CP $\times$ CE

$$= 4 \text{ CP} \times \text{CT, sine CTE}$$
$$= 4 \text{ CT} \times \text{CP, sine TCD}$$
$$= 4 \text{ CT} \times \text{CP} \times \text{sine DCM}$$
$$= 4 \text{ CT CD} \times \text{sine DCM} \therefore \text{CP} = \text{CD}$$
$$= 4 \text{ CT} \times \text{DM}$$
$$= 4 \frac{a^2}{x} \times \frac{bx}{a}$$
$$= 4 ab.$$

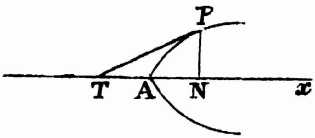
Therefore the areas of all parallelograms circumscribing an ellipse will be severally=4 ab, which is a constant quantity; and things which are equal to the same thing are equal to one another, therefore all the parallelograms circumscribing an ellipse are equal to one another.

Q. Shew how to draw a tangent to a given parabola, from a given point either in or without the curve?

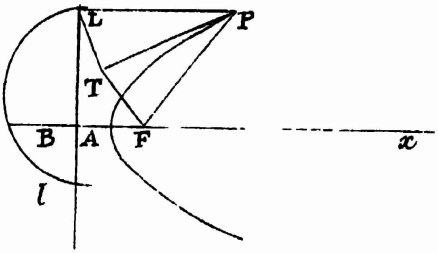
A. First let the point be in the curve; join PF, draw PL parallel to AX, and bisect the angle FPL by the line PT; this line is a tangent to the parabola at P.



There are several other methods of drawing a tangent, when the point is in the curve, for instance one is from P, drop down a ⊥ upon A x and take AT = AN and join PT; this line is a tangent.



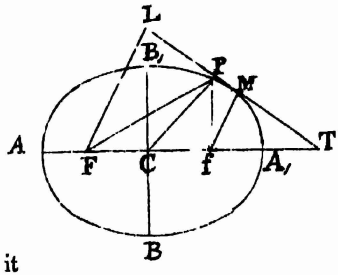
Secondly, let the point be without the curve.



As T, then from this point as centre and radius = TF, or the focal distance of the point, draw a circle cutting the directrix in the point L and l. From L draw LP ⊥ to the directrix, and let it cut the curve in P, and join PF and PT; then PT is a tangent ∵ PF = PL, and PT is common to the two △s FPT and TPL, and the base TF = TL, being radii of the same circle, then the ∠ FPT = ∠ TPL, and hence PT is a tangent.

Q. Prove that in the Ellipse and Hyperbola the rectangle contained by the perpendiculars let fall from the foci on any tangent, is equal to the square of the semi-axis minor.

A. Let AB A′B′ be an ellipse, C its centre; F, f, the two foci, LPT a tangent, at P, f M and FL two perpendiculars upon it



from both the foci, 2 a its major axis and 2 b its minor axis, FP = r, then P f = 2 a—r, let p be the length of one ⊥ and p′ that of the other, then we have for the length of the perpendicular the formula

$$p^2 = \frac{b^2 \quad r}{2a-r} = \frac{b^2 \ FP.}{f \ P}$$

$$\text{and for the other } p'^2 = \frac{b^2 \quad r'}{2a-r'} \cdot \left(\begin{matrix} r \text{ being in this case} \\ = f\,P \end{matrix}\right)$$

$$= \frac{b^2, f\,P}{F \quad P}$$

multiplying these equations we have

$$p^2 \cdot p'^2 = \frac{b^2 . \ FP}{f \quad P} \cdot \frac{b^2 . \ f \ P}{F \quad P}$$

$$= b^4$$

$$\therefore p . p' = b^2$$

$$\text{or } f\,M . \ FL = b^2 = BC^2$$

Q. The curved surface of a cone being constant, find the radius of the base, when the volume is a maximum.

A. Let x = radius of the base of the cone

and y = its altitude

then its curved surface $= \pi x \,.\, \sqrt{x^2 + y^2}$,

and its volume $= \pi x^2 . \frac{1}{3} y$

$= \frac{1}{3} \pi x^2 y$

but the curved surface being constant let it be a.

$$\text{then } a = \pi x \sqrt{x^2 + y^2}$$

$$\text{or } a^2 = \pi^2 x^2 (x^2 + y^2)$$

$$= \pi^2 x^4 + \pi^2 x^2 y^2$$

$$\text{then } y^2 = \frac{a^2 - \pi^2 x^4}{\pi^2 x^2}$$

$$\text{and } y = \frac{\sqrt{a^2 - \pi^2 x^4}}{\pi x}$$

$$\text{Now } u^* = \tfrac{1}{3} \pi x^2 y = \tfrac{1}{3} \pi x . x \times \frac{\sqrt{a^2 - \pi^2 x^4}}{\pi x}$$

$$= \tfrac{1}{3} x \sqrt{a^2 - \pi^2 x^4}$$

$$\text{or } x \sqrt{a^2 - \pi^2 x^4} = \text{maximum}$$

$$\text{then } \frac{du}{dx} = \sqrt{a^2 - \pi^2 x^4} - \frac{4 \pi^2 x^4}{2 \sqrt{a^2 - \pi^2 x^4}} = 0$$

$$\text{or } a^2 - \pi^2 x^4 - 2 \pi^2 x^4 = 0$$

$$\text{or } 3 \pi^2 x^4 = a^2$$

$$\text{i. e. } x^4 = \frac{a^2}{3 \pi^2}$$

$$\therefore x = \sqrt[4]{\frac{a^2}{3 \pi^2}} = \sqrt{\frac{a}{\pi}} \cdot \frac{1}{3^{\frac{1}{4}}}$$

$$\text{and } y = \sqrt{\frac{2 a}{\pi}} \cdot 3^{\frac{1}{4}}$$

---

* Or the volume of the cone.

Q. Divide a given line into two parts such that their product multiplied by their difference may be a maximum.

A. Let 2 a be the given line,

and $a + x$, and $a - x$ its two parts,

then $(a + x)(a - x) \times 2x$ must be a maximum

then $d.(a^2 - x^2).2x = 0$

$$\text{or } 2(a^2 - x^2) - 2x \times 2x = 0$$

$$\text{or } 2a^2 - 2x^2 - 4x^2 = 0$$

$$\text{or } 2a^2 - 6x^2 = 0$$

$$\text{or } a^2 - 3x^2 = 0$$

$$\text{then } x^2 = \frac{a^2}{3}$$

$$\therefore x = \frac{a}{\sqrt{3}}$$

and hence $a + x$, and $a - x$ are found.

Q. Differentiate $\dfrac{a + x}{a^2 + x^2}$

A. Here, $u = \dfrac{a + x}{a^2 + x^2}$

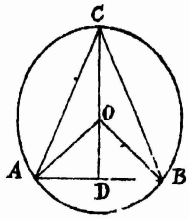
$$du = \frac{(a^2 + x^2).d(a + x) - (a + x).d.(a^2 + x^2)}{(a^2 + x^2)^2} dx$$

$$= \frac{a^2 + x^2 - 2x(a + x)}{(a^2 + x^2)^2} dx$$

$$= \frac{a^2 + x^2 - 2ax - 2x^2}{(a^2 + x^2)^2} dx$$

$$= \frac{a^2 - 2ax - x^2}{(a^2 + x^2)^2} dx$$

Q. Compare the perimeter of an equilateral triangle inscribed in a circle with that of other isosceles triangles in the same circle.



A. Here let ABC be an equilateral $\triangle$ inscribed in a circle, whose radius OA = r,

then AD = AO. cos OAD

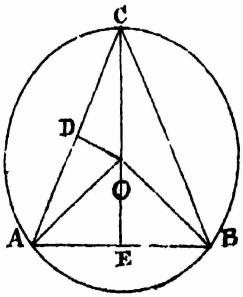
$$= AO. \cos 30^\circ \because OAD = \tfrac{1}{2} CAD = \tfrac{1}{2}\, 60^\circ = 30^\circ$$

$$\therefore \tfrac{1}{2} AB = r \cos 30^\circ$$

$$= r \frac{\sqrt{3}}{2}$$

then $3\, AB = 3\, r \sqrt{3}.$

Again let there be any isosceles triangle in the same circle, for instance take one whose vertical angle is



30° then CD in the figure

$$= OC \cos 15^\circ$$

or $CD = r \cos 15^\circ$

and 2 CD or AC $= 2\, r \cos 15^\circ$

and $AC + CB = 4\, r \cos 15^\circ$

Again $AC.\ CB = 2\, r\, C\, E$

$$= 2\, r \sqrt{AC^2 - AE^2}$$

or $AC^2\, CB^2 = 4\, r^2\, (AC^2 - AE^2)$ putting AC = CB = a

we have $a^4 = 4\, r^2\, (a^2 - AE^2)$

i. e. $a^4 = 4\, r^2\, a^2 - 4\, r^2\, AE^2$

$$\therefore 4\, A\, E^2 = \frac{4\, r^2\ a^2 - a^4}{r^2}$$

i. e. $2\, A\, E = \dfrac{a}{r} \sqrt{4\, r^2 - a^2}$

$$= \frac{2r \cos 15^\circ \sqrt{4\, r^2 - 4\, r^2 \cos^2 15^\circ}}{r}.$$

$$= 2 \cos 15^\circ \; 2\,r \,.\, \text{sine } 15^\circ$$
$$= 4\,r \cos 15^\circ \text{ sine } 15^\circ$$
$$= 2\,r \text{ sine } 30^\circ$$
$$= r$$

as it must be because $\angle$ AOB $= 60^\circ$
and AB is the side of a hexagon
then $AC + CB + AB = 4\,r \cos 15^\circ + r$

$$= (4 \cos 15^\circ + 1)\,r$$
$$= \left(4\,\frac{\sqrt{3}+1}{2\sqrt{2}} + 1\right) r$$
$$= \left(\frac{2\sqrt{3}+2}{\sqrt{2}} + 1\right) r$$
$$= \frac{2\sqrt{3}+\sqrt{2}+2}{\sqrt{2}}\,r$$

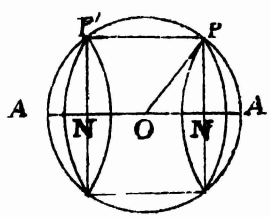
$\therefore$ the perimeter of this Isosceles $\triangle$: perimeter of the above equilateral

$$\triangle :: \frac{2\sqrt{3}+\sqrt{2}+2}{\sqrt{2}}\,r : 3\sqrt{3}.r$$
$$:: \frac{2\sqrt{3}+\sqrt{2}+2}{\sqrt{2}} : 3\sqrt{3}$$

and similarly of any other isosceles triangle.

Q. Inscribe the greatest cylinder in a given sphere.

A. Let A^1P^1PA be the given sphere.



Let ON $= x$, NP $= y$
then the volume of the cylinder
whose radius of the base is y, and whose altitude is $2\,x$

$$= \pi\, y^2 \times 2\,x$$
$$= 2\,\pi\, y^2\, x$$
$$= 2\,\pi\,(a^2 - x^2)\,x,$$ a being the radius of the sphere,

then $u = 2\pi(a^2 - x^2)x$ or $x(a^2 - x^2)$ = maximum, rejecting the constant factors,

$$\text{and } \frac{du}{dx} = a^2 - x^2 - 2x^2 = 0$$

$$\text{or } a^2 - 3x^2 = 0$$

$$\therefore x = \frac{a}{\sqrt{3}}.$$

$$\text{and } y = \sqrt{a^2 - x^2} = \sqrt{a^2 - \frac{a^2}{3}} = \sqrt{\frac{2a^2}{3}}$$

$$= a\sqrt{\frac{2}{3}}$$

$$\therefore 2x = \frac{2a}{\sqrt{3}} = \text{altitude of the cylinder}$$

$$\text{and } 2y = \frac{2a}{\sqrt{3}}\sqrt{2} = \text{diameter of its base.}$$

Q. Define a differential.

A. The differential of given quantity is the difference between that quantity and its value, after it has received a certain increment, for instance let $u = f(x)$ be a quantity; if there is any change in x, there must be a corresponding change in u, let x become $x + h$, then u will become u, and

$$\text{then } u, = f(x + h)$$

$$\text{but } u = f(x)$$

$$\text{then } u, - u = f(x + h) - f(x)$$

$$= f(x) + \frac{d\,f(x)}{dx}h + \&c. \ldots \&c. \ldots\ldots \&c. - fx$$

$$= \frac{d\,f(x)}{dx}h + \&c.\ \&c.$$

$$\therefore (u, - u) \text{ or } du = \frac{d\,f(x)}{dx}h$$

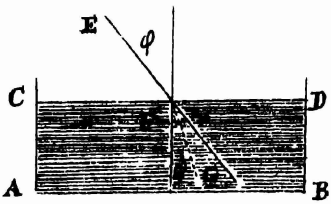
Therefore the differential of a quantity $u = f(x)$ is the second term of the expansion of $f(x + h)$. Differential and difference differ the less, the less h is.

Q. Find the principal focus of a plane convex lens ?

A. The principal focus of a plane convex lens or of any other lens can be found thus: take a scale of equal parts, and a candle, and a screen, place the lens between the screen and the candle, upon the scale of parts, and remove the screen backwards and forwards, till the most perfect and brightest image of the candle be formed upon the screen; take the distance between the screen and the candle, and divide it by four, and the quotient will be the distance of the principal focus of the lens, from the centre of the lens.

Q. A straight rod being dipped into a vessel of water, find the angle of its inclination to the surface when the apparent bending is greatest.

A. Let ABDC be a vessel full of water, E g the rod dipped into it, φ the angle of incidence, φ' the angle of refraction, then sine $\varphi = \mu$ sine φ', and then the deviation increases with the angles of incidence and refraction, and the angle of refraction increases with the angle of incidence, therefore when the angle of incidence is greatest, the angle of refraction is greatest too; but the angle of incidence cannot be greater than 90°, therefore when the angle which the rod makes with the surface of the water, is 0, the angle of refraction is greatest, and the deviation or apparent bending is greatest. But the angle with the surface must not be strictly zero, but very small.



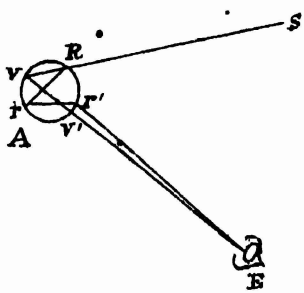
Q. Determine the position of a double convex lens between the eye and an object at a given distance, when the apparent magnitude is a maximum.

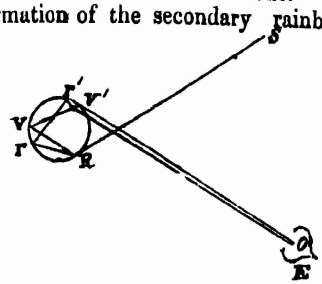
A. The object of a lens is to magnify an object; but when the apparent magnitude is greatest, there is no necessity of placing a lens between the object and the eye, but if there be, let the lens be placed at half the distance between the object and the eye, for then it would neither magnify or diminish the object.

Q. Explain the phenomenon of the rainbow.

A. The phenomenon of the rainbow is caused by the refraction of the sun's light by drops of rain; the drops of rain are small spheres of water, the phenomenon is seen by the spectator when he is standing with his back towards the sun.

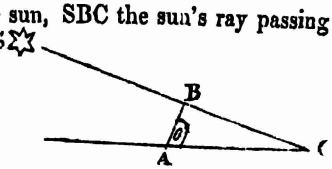
Let A be a drop of water, and SR a ray of light incident on it; this ray is refracted by the sphere, and divided into seven different colored rays, the extremes being the red and violet; these rays are reflected by the sphere into r r′ and v v′ and then again refracted, and then they reach the eye of the spectator at E, who witnesses all the prismatic colors in the heavens in front of him. This rainbow thus formed, is called the primary rainbow, and is formed by two refractions and one reflection. But there is another rainbow, called the secondary rainbow, and is formed by two refractions and two reflections. The figure will give an idea of the formation of the secondary rainbow. SR a ray from the sun is refracted first into R r, and R v, which are reflected in r r′ and v v′ and these being again reflected and then refracted reach the eye of the spectator who sees an arch of different prismatic colors in the heavens, the violet being the uppermost and the red the undermost, whereas in the primary rainbow the red was the uppermost and violet the undermost.





Q. The sun's altitude being 30° find the position of a rod of given length, that the length of its shadow on a horizontal plane may be the greatest possible. And find that length.

A. Let AB be the rod, S the sun, SBC the sun's ray passing at the top of the rod and touching the ground at C, then AC is the length of the shadow of the rod, and ∠ACB the altitude of the sun = 30°. Let ∠BAC = θ, and AB = a, the length of the rod, then



$$AC : AB :: \text{sine } ABC : \text{sine } ACB$$
$$:: \text{sine } (\theta + 30^\circ) : \text{sine } 30^\circ$$
$$\therefore AC = \frac{\text{sine } (\theta + 30^\circ)}{\text{sine } 30^\circ}, AB$$
$$\text{or } AC = \frac{a}{\text{sine } 30^\circ} \text{ sine } (\theta + 30^\circ)$$
$$= \text{sine } (\theta + 30^\circ) = \text{maximum}$$
$$\text{then } d\,AC = \cos (\theta + 30^\circ)\, d\theta$$
$$= 0$$
$$\text{or } \cos (\theta + 30^\circ) = 0 = \cos 90^\circ$$
$$\therefore \theta + 30^\circ = 90^\circ$$
$$\text{and } \therefore \theta = 60^\circ$$

Therefore the rod must be inclined to the horizon at an angle of 60°, and hence the angle at the top of the rod between the ray of light, and the rod itself must be a right angle.

As for the length of the shadow

$$AC \cos 60^\circ = AB$$
$$\text{or } AC = \frac{AB}{\cos 60^\circ}$$
$$= \frac{a}{2}$$
$$= 2\,a$$
$$= 2\,AB$$

Therefore the length of the shadow when greatest is twice the length of the rod. At any other position of the rod, the shadow will be less than 2 a.

Q. Mention the several corrections to be applied to an altitude observed with the sextant.

A. When the altitude of any heavenly body is taken with a sextant, the altitude is not the true altitude but the apparent one; in order to find the true one, several corrections must be applied, viz., "refraction," "parallax," "aberration," &c. These change the true places of the heavenly bodies, and what we see by observation is only the apparent one; before applying the observed altitudes to astronomical purposes, we must correct them for the effects of parallax, refraction, &c.

Q. Describe the method of fixing a meridian line.

A. The first and simplest method of fixing a meridian line is the following. Fix a vertical gnomon upon an horizontal plane, and draw several concentrix circles round it, its foot being the centre; mark the shadow of the gnomon on one of these circles in the morning, and mark that point in the evening where the shadow of the gnomon touches the same circle, or the extremity of the shadow lies exactly in the circumference of the same circle; then bisect the arc of the circle between those two points, and the line joining the point of bisection with the centre of the circle, is the meridian line.

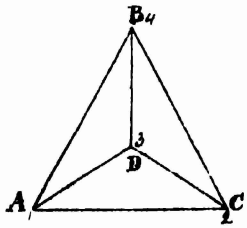
In this case, the declination of the sun is supposed invariable, and the result is not a correct one, but only a rough one.

Another method is this. Take a plumb line, and suspend it at a convenient distance from a plate of metal, which having a hole at its top, must be fixed in some place a little above the horizon, or at the height of four or five feet, then when two stars, whose right ascensions are very nearly equal, or differ by 180°, viewed through the hole in the plate, are bisected by the plumb line, the plane passing through the centre of the hole and the plumb line is the meridianal plane, and its intersection with the horizon is the meridian line.

The two stars, in the tail of the bear, whose right ascensions differ by 177° 43′, are adapted for this purpose.

Q. Find the common centre of gravity of four bodies of 1 2, 3, and 4lbs., placed at the angles of a triangular pyramid, whose sides are each one foot.

A. Let ABCD be the given pyramid,

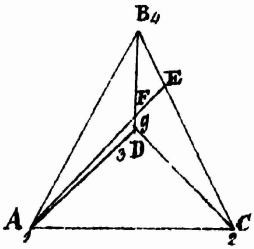


AC = 12 inches = BC = AB = AD = DC

= BD

1, 2, 3, 4, are the weights placed at the four angular points of it, then in order to find the common centre of gravity of these four bodies we must first find the centre of gravity of 2, and 4, on the line BC, and then of 1, and 6 or the sum of 2 and 4, on the line joining the point A with the centre of gravity first found, and then of 3 and 7, on the line joining D, and the centre of gravity second found.

Here the centre of gravity of 2 and 4, lies at the point E, BE being 4 inches; now the length AE



$$= \sqrt{AB^2 + BE^2 - 2\,AB, BE \cos ABE}$$

$$= \sqrt{12^2 + 4^2 - 2 \times 12 \times 4 \cos 60^\circ}$$

$$= \sqrt{144 + 16 - 48}$$

$$= \sqrt{112}$$

$$= 4\sqrt{7}$$

and then supposing F to be the centre of gravity of 1 and 6, we have

$$AF : 4\sqrt{7} - AF :: 6 : 1.$$

$$\text{or } x : 4\sqrt{7} - x :: 6 : 1. \text{ putting } AF = x$$

$$\text{hence } x = \frac{24}{\sqrt{7}}$$

Now the common centre of gravity of all the four bodies lies in the line DF, somewhere about g, the force at D being 3′, and at F 7′. In order to find the point g, we must first find the length of DF; and having found DF we have

$$Dg : gF :: 7 : 3, \text{ or } \frac{Dg}{gF} = \frac{7}{3}$$

$$\text{or } \frac{Dg + gF}{gF} = \frac{10}{3} \text{ or } gF = \frac{3}{10} \text{ of DF}$$

Q. Two chords AB, AC, of a circle represent two forces. AB being given, find AC when their Resultant is a maximum.

A. Let AB be one of the chords and AC the other, let θ be the angle between them, and $AC = x$, and let $AB = a$

then the Resultant $R = \sqrt{a^2 + x^2 + 2a\,x \cos\theta}$

$$\text{or } R^2 = a^2 + x^2 + 2\,ax \cos\theta$$

differentiating with respect to x,

$$0 = 2x + 2a \cos\theta \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (1)$$

Differentiating with respect to θ, $0 = 2\,ax \text{ sine } \theta \quad \ldots\ldots (2)$

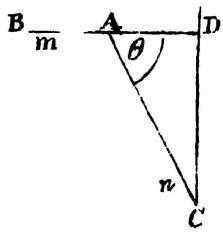
from (1) $\cos\theta = \dfrac{x}{a}$

$$\cos^2\theta = \frac{x^2}{a^2}$$

from (2) $\text{sine}^2\,\theta = 0$,

$\therefore 1 = \dfrac{x^2}{a^2} \therefore x = a$, or AC must be equal to AB, in order that the Resultant may be maximum.

Q. The arms of an uniformly bent lever weigh m and n pounds. What angle do they form with each other, being at rest with the shorter arm horizontal?



A. Let AB and AC be the arms of the lever weighing m and n lbs in its state of rest,

Let $\angle$ DAC $= \theta$

then by the problem

$m : n :: AC \cos\theta : AB$

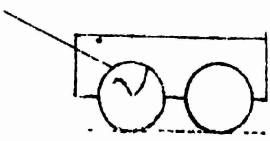
$:: a \cos\theta : b$; putting a and b for the lengths of the arms

or $b.\,m. = n,\, a,\, \cos\theta$

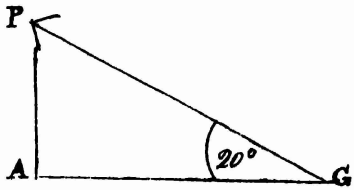
$$\therefore \cos\theta = \frac{b}{a} \cdot \frac{m}{n}.$$

hence θ is found, and thence $180° - \theta$, or the required angle between the arms.

Q. A Truck or Cart weighing 4000lbs. is to be dragged forward by a force applied at or in the direction of its centre of gravity, and raised 20° above the horizontal. Find the amount of force so applied, requisite to move it. Friction, supposed to act horizontally, being taken at 300lbs. Find also when it has attained a velocity of 88 feet per minute, the force requisite to maintain that velocity.



A. Let G be the centre of gravity of the Truck weighing 4000lbs. P a force applied to move it, in the direction PG, PGA being 20°. Now the friction is 300lbs., and this force



of 300lbs. must be overcome by an equal force on the opposite side, or it adds to the weight of the Cart, and then we will suppose the Cart to weigh 4300lbs., the friction being supposed to be annihilated, then the component of P in the direction GA must be equal to or greater than 4300lbs. before the Cart is moved, and hence we have the equation

$$P \cos 20^\circ = 4300$$

$$\text{or } P = \frac{4300}{\cos 20^\circ}$$

$$\therefore \log P = \log 4300 - \log \cos 20^\circ + 10$$

$$= 3.633468 - 9.972986 + 10$$

$$= 3.66048$$

$$= \log 4576$$

$$\therefore P = 4576\text{lbs.}$$

This force when applied in the direction PG will not, mathematically speaking, move the Cart, but keep it in equilibrium; therefore a force little more than 4576lbs. will move the Cart; therefore the force requisite to move it must be about 4600lbs.

Q. At what angle must two equal forces act that the Resultant may be equal in magnitude to one of the components? Find the angle when the Resultant is the nth part of either.

A. Let P and P be two equal forces acting on the point A. let the angle $PAP = \theta$,

the nthe Resultant of these forces

is $\sqrt{2 P^2 + 2 P^2 \cos \theta}$

or $R^2 = 2 P^2 + 2 P^2 \cos \theta$, putting R for the Resultant.

Now by the problem $R = \frac{P}{n}$

$$\therefore \frac{P^2}{n^2} = 2 P^2 + 2 P^2 \cos \theta$$

$$\text{or } \frac{1}{n^2} = 2 + 2 \cos \theta$$

$$i.e. \cos \theta = \frac{\frac{1}{n^2} - 2}{2 n^2}$$

hence the angle required between the forces is found.
Let $n = 1$, or $R = P$ one of the conditions given in the problem,

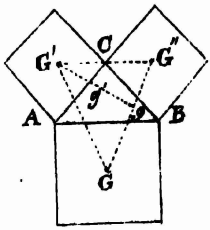
$$\therefore \cos \theta = \frac{1 - 2}{2} = -\frac{1}{2}$$

$$\text{or } \cos (180 - \theta) = \frac{1}{2} = \cos 60^\circ$$

$$\therefore 180^\circ - \theta = 60^\circ \therefore \theta = 120^\circ$$

Therefore in order that two equal forces acting upon a point may have their Resultant equal to one of them, they must make an angle of 120° with each other.

Q. Find the centre of gravity of the three squares described on the sides of a right angled triangle ?



A. Let ACB be the right angled triangle, G, G′, G″ the centres of gravity of the three squares upon the three sides, then the length GG″ is known in terms of the sides and angles of the △ABC, because $GG''^2 = GB^2 + BG''^2 - 2\, BG . BG'' \cos GBG''$

$$= \frac{AB^2}{2} + \frac{BC^2}{2} - 2 \frac{AB \,.\, BC}{2} \cos (90^\circ + B)$$

$$= \frac{c^2 + a^2}{2} + a\, c \text{ sine } B$$

$$= \frac{a^2 + c^2 + 2\, a\, c \text{ sine } B}{2}$$

similarly we can find GG′, and G′G″ in terms of the sides and angles of the △ ABC.

Now supposing g to be the common centre of gravity of the squares on AB and BC, we have

$$Gg : gG'' :: \text{square upon } BC : \text{square upon } AB$$
$$:: a^2 : c^2$$

$$\therefore \frac{Gg}{gG''} = \frac{a^2}{c^2}$$

$$\text{or } \frac{Gg + gG''}{gG''} = \frac{a^2 + c^2}{c^2}$$

$$\text{or } GG'' = gG''. \frac{a^2 + c^2}{c^2}$$

$$\therefore g\,G'' = \frac{GG''.\,c^2}{a^2 + c^2}$$

$$= \frac{(a^2 + c^2 + 2\ ac \text{ sine } B)\ c^2}{a^2 + c^2}$$

Now we can also find the length G′g in terms of the sides and angles of the △ ABC, for in the △ G′Gg we know the sides GG′ and Gg, and the angle G′Gg, having found G′g, we have

$$gg' : g'G' :: AB^2 :: AB^2 + BC^2$$

$$:: b^2 : a^2 + c^2$$

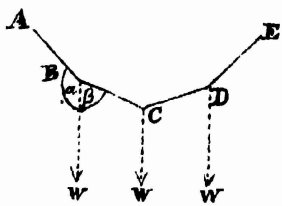
$$\text{and } \frac{gg'}{g'G'} = \frac{b^2}{a^2 + c^2}$$

$$\text{or } \frac{gg' + g'G'}{g'G'} = \frac{a^2 + b^2 + c^2}{a^2 + c^2}$$

$$\text{or } gG' = g'G' \times \frac{a^2 + b^2 + c^2}{a^2 + b^2}$$

$\therefore\ g'G' = \dfrac{a^2 + c^2}{a^2 + b^2 + c^2} \times gG'$ whose gG′ is known. Now we require the distance of g′ from one of the angles of the triangle suppose from A, then Ag′ can be found from the △ g′AG′, in which we know AG′ and G′g′ and the included angle, and we can also find the ∠ CAg′ which is the difference of G′Ag′ (which can be found from the △ G′Ag′) and G′AC.

Q. Shew how to find the tension at any point of a chain of known weight suspended between two fixed points—equal weights being suspended from it at equal intervals.



A. Let AB, BC, CD, DE be the equal intervals of the chain at which equal weights W, W, W, are suspended, let T_1 be the tension in AB, and T_2 the tension in BC, then the point B is kept in equilibrium by the three forces T_1 and T_2 and W; let ∠ ABW = α, and WBC = β,

since $T_1 : T_2 :: \text{sine}\ \beta : \text{sine}\ \alpha$

$$T_1 . \text{sine}\ \alpha = T_2\ \text{sine}\ \beta$$

$$T_1\ \text{sine}\ \alpha - T_2\ \text{sine}\ \beta = 0$$

$$T_1 \cos \alpha + T_2 \cos \beta - W = 0$$

adding these we have

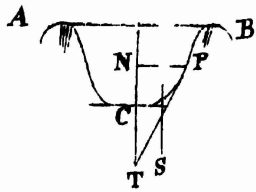
$$T_1\ (\text{sine}\ \alpha + \cos \alpha) + T_2\ (\cos \beta - \text{sine}\ \beta) = W$$

if we know T_1 which is the force applied at A and denote it by P we have

$$T_2 = \frac{W - P\ (\text{sine}\ \alpha + \cos \alpha)}{\cos \beta - \text{sine}\ \beta}$$

or the tension at B is found, and similarly at other points.

If there were no weights suspended, but only a chain between two points A and B, the tension would be found in the following manner S is the weight of the portion of the chain CP, let t be the tension at P,C, being the lowest point of the curve we have



tension at P : S :: PT : TN

$$\text{or}\ \frac{t}{s} = \frac{ds}{dx},\ \frac{ds}{dx}\ \text{being the secant of the angle PTN,}$$

but $S^2 = x^2 + 3cx$,* c being the tension at C, we have

$$2s\frac{ds}{dx} = 2x + 2c$$

$$\text{or}\ \frac{ds}{dx} = x + c$$

$$\therefore t = x + c,\quad x\ \text{being} = CN.$$

Q. With what velocity must a body be projected vertically downwards from a height of 150 feet, that the time of its descent may be two-seconds?

A. Here $S = v\,t + \frac{1}{2}\,g\,t^2$, v being supposed to be the velocity of projection,

$$\text{or}\ 150 = v, \times 2 + 16 \times 4$$
$$= v, \times 2 + 64$$

* One of the equations of the Catenary.

$$\therefore v = \frac{150 - 64}{2}$$

$$= \frac{86}{2} = 43 \text{ feet per second.}$$

Q. A body has fallen from A to B when another is let fall from C, a known distance below B, where will the first overtake the second?

A. Let AB the space fallen by the first body = a, the distance BC = b

Let T be the time from the beginning of the fall of the first body, to the time when it overtakes the second body,

now $a = \frac{1}{2}gt^2$, t being the time of the fall from A to B, of the first body,

and from this equation we know t.

The space fallen through by the first body when it overtakes the second

$$= \frac{1}{2} g T^2$$

while that fallen through by the second

$$= \frac{1}{2} g (T - t)^2$$

$$\therefore \frac{1}{2} g T^2 = a + b + \frac{1}{2} g (T - t)^2$$

which determines T.*

Questions in Physics proposed to the Senior Class Agra College, and Answers by Kunhya Lall.

Question. Describe the different kinds of attraction, and mention a few such instances of the manifestation of each as may appear to you most striking and important.

Answer. Attractions are of four kinds, viz. attraction of gravitation, attraction of cohesion, capillary attraction, and magnetic attraction. Attraction of gravitation is that force by which the earth draws everything here unsupported in air towards itself, and which force is supposed to be lodged in the earth's centre, for every body, when left to

* If the value of T be deduced from this equation, and substituted in the expression $\frac{1}{2} g T^2$ we shall have the space required.

itself in air, falls in a vertical line, which if produced will pass through the earth's centre. This force is manifested in daily occurrences; for every thing when left to itself in air, we see, falls towards the earth; water is subject to the attraction of gravitation; were it not so, water would run over, here and there, and would not remain in its place.

Attraction of cohesion is that power in the particles of fluids by which they are kept together: it is by this force only that a drop of water can remain hanging at the end of the finger; this power is greatly manifested in solids; the particles of solids are so firmly attached to each other, that great strength is required to pull a solid body asunder; were such not the case with solids a table would no longer remain standing on its legs but fall to the ground. This force, on the contrary, does not exist in gases at all,—there exists a repulsive force in the particles of gases.

Capillary attraction is that force by which a fluid is urged up in tubes of hair-like bores. If several tubes, whose bores are infinitely small, be put in a fluid with their ends upwards, after a short interval, the fluid will rise up in all of them, in a proportion inversely as the diameters of their bores. It is this power by which water is supplied to the upper parts of plants. When water is poured round the stem of a tree in a garden, this water nourishes the whole tree. The tree has got in it infinitely small bores through which water rises up, to nourish the upper part of the tree.

Magnetic attraction is manifested in magnets. It is that power lodged in them by the effects of voltaic electricity by which they are enabled to attract smaller pieces of iron towards themselves. A soft piece of iron, round which a current of electricity is made to pass, will attract a smaller piece than itself: this was proved by experiment when the lectures were delivered.

Q. Give an outline of the discovery of the planet Neptune?

A. The Astronomer Adams having calculated the form of the orbit of Uranus, found by observation, that the calculated form did not coincide with the observed one, and that the planet Uranus was at several parts of its orbit deflected from the theoretically calculated path. This led him to think that there must be some power near Uranus which caused the observed deflection, and by constantly observing the deflections of Uranus from its true path, he concluded that there must be a planet beyond the orbit of Uranus which caused that deflection. From his observations he calculated the place of the planet thought of, for a certain day in the heavens; and when towards that point of the heavens he pointed his telescope, he found that there was such a planet. This shews the invincible truth of Theory and Mathematical demonstration. This planet named Neptune, was at

the same time discovered by the French Astronomer Le Verrier; so that Adams and Le Verrier both contend for the honor of being the discoverer.

Q. State in order the equations of uniformly accelerated motion, and show their application to retarded motion also?

A. The equations for uniformly accelerated motion are $s = \frac{1}{2} gt^2$, and $V = g\,t$; where s represents the space traversed, by a body falling freely through the time t, and V the velocity acquired in that time, g is the gravity being = 32.16 feet. If instead of the body falling freely, it be projected either downwards or upwards with a certain velocity say v, the above equations become

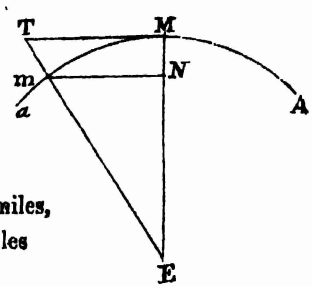
$$s = v,\ t \pm \tfrac{1}{2}\ g\ t^2$$
$$\text{and } V = v, + g\ t$$

The sign + applies when the body is projected downwards, and — when upwards.

These two equations are the fundamental equations of motion, and from these all the problems regarding the falling or projection of bodies vertically upwards or downwards, and the velocities acquired by them, can be solved.

Q. The distance between the centres of the earth and the moon being 60 of the earth's radii, what will be the amount of deflection of the moon from her tangential path by the influence of the earth's attraction, in a minute; and the mass of the moon being to that of the earth in the ratio of .0125 : 1, how much will the earth be displaced by gravitation during the same time.

A. Let AM m a be a portion of the moon's orbit, M m, two positions of the moon, MT a tangent to the orbit at M; E the position of the earth, radius 4000 miles,



then ME = 60 × 4000 = 240000 miles

whole length of the moon's orbit

$$= 2\,\pi \times 240000$$
$$= 4\,\pi \times 80000$$
$$= 1507200 \text{ miles}$$

Now the moon's synodic period

$$= 27\tfrac{1}{3} \text{ days}$$
$$= 27\tfrac{1}{3} \times 24 \text{ hours}$$
$$= 27\tfrac{1}{3} \times 24 \times 60$$
$$= 39360 \text{ minutes}$$

∴ space traversed by the moon in a minute

$$= \frac{1507200}{39360}$$
$$= 38.29 \text{ miles} = \text{M m}$$

Now $\widehat{\text{T m}}$ the deflection from the tangential path

$$\text{MT.} = \frac{\text{M m}^2}{2\text{ME}} = \frac{38.29^2}{480000} = \text{MN very nearly}$$
$$= 18 \text{ feet nearly}$$

Had we taken 3956 miles as the value of the earth's radius, we should have got T m or MN = 16 feet, which is the space fallen through by a body on the earth's surface in one second.

Again let x = space through which the earth will be displaced by gravitation,

$$1 : 0125 :: \frac{(38.29)^2}{480000} : x$$

$$\text{or } x = \frac{(38.29)^2}{480000} \times .0125.$$

Q. What inference regarding the figure of the earth was Newton led to, by the consideration of the effects of centrifugal force; has that inference been supported or otherwise, by subsequent discovery and investigation, and if so by what?

A. By consideration of the effects of the centrifugal force, Newton was led to believe that the figure of the earth must be like that of an oblate spheroid; *i. e.* the polar diameter must be less than the equatorial one. This compression or ellipticity of the earth has now been fully determined by numerous methods to be equal to $\frac{1}{300}$ nearly. This value of the compression has been determined most correctly by trigonometrical surveys, by measurements of the arcs ⊥ to the meridian, and by means of the pendulum. The equatorial diameter is found greater than the polar by nearly 26 miles. The prime object of trigonometrical surveys has been to determine the true form of the earth. Equal arcs of meridians measured in countries near the equator, and near the poles, do not coincide in their numerical values, those near the poles being greater in length than those near the equator, which leads to the inference that the earth is not a sphere.

The length of pendulum varies in different latitudes; that at the equator being shortest and at the poles greatest. Now if every point in the earth's surface were equally distant from the centre, the length of the pendulum would not vary, but since it varies, it proves that the earth is not a sphere, or that every point on its surface is not equally distant from the centre.

Q. Mention such of the laws of centrifugal force as you may remember, and illustrate by diagram the manner in which that force aids in producing planetary motion?

A. The following are some of the laws of centrifugal force.

1st. The greater the quantity of matter in any body is, the greater is its centrifugal force.

2. The greater the velocity of any body is, the greater is its centrifugal force.

3. Bodies that have their velocities and masses equal, have their centrifugal forces equal.

4. Bodies that have their velocities and masses unequal, have their centrifugal forces unequal.

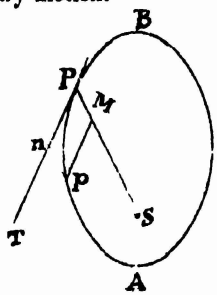
5. Bodies that have their masses and distances from the centre inversely proportional, have their centrifugal forces equal.

6. The squares of the periodic times vary inversely as the forces.

7. The squares of the periodic times are as the cubes of the distances from the centre.

The last is the third law of Kepler regarding the planetary system.

The following is the manner shown by the figure in which the centrifugal force aids in producing planetary motion.



Let ABP be the orbit of a planet. S the sun, the centre of the attractive force; P any portion of the planet in its orbit. Then the attraction of the sun draws the planet in the direction SP, while the centrifugal force of the planet pushes it in the direction PT. Now the planet neither goes in the direction PS, nor in that of PT, but takes a midway course Pp. Pp representing the resultant of the forces acting in PS and PT, and represented, by the lines PM, Pn, the sides of the □ M n: thus the harmony of the solar system is maintained.

Q. Mention the laws of fluid pressure, and point out what they have to do with the level of the ocean, the production of springs, and the flow of rivers?

A. The following are the laws of fluid pressure:

I. Equal fluid columns of different densities exert pressures proportional to their densities.

II. Fluid columns of equal densities exert pressures directly as their heights.

III. Fluid columns of different densities exert pressures proportional to the products of their heights and densities.

The level of the ocean is maintained by these properties of fluids; but if one part of the ocean exerted a greater pressure than the other part, that part would sink down, and the level of the ocean would be disturbed.

Springs are produced when the pressure of water underneath a mountain becomes great, for the fluid then makes a passage for itself to go out.

Q. Who was Toricelli? what important discovery did he make and what led to it?

A. Toricelli was a Professor at Florence: he was a great mathematician and a philosopher. Before his time there prevailed different notions concerning the ascent of fluids in a vacuum; the explanation put upon that point was that "nature abhors a vacuum;" that as soon as the air is exhausted out of a tube, water runs up into it (the tube having a communication with water) because "nature abhors a vacuum." But when mercury did not rise more than 30 inches high, they said that nature made an exception in the case of mercury. When Toricelli found that water could not rise more than 32 or 33 feet in a tube, whose vacuum exceeded 32 or 33 feet, he endeavored to discover the true cause of it, and at length explained that the pressure of the air upon the water out of the tube supported a column of water 33 inches high in the tube, and that the pressure of air on the mercury out of the tube maintained a column of mercury 30 inches high in the tube. This was the true explanation of the ascent of fluids in tubes which were empty of air, and this was the splendid discovery of Toricelli.

Q. Describe the construction and principle of action of the Barometer, the Thermometer and Syphon.

A. The Barometer is an instrument for measuring the pressure of the atmosphere. It is made up of a tube of glass of about 33 inches height, with one end sealed up and the other inserted in a cup of mer-

cury. The tube is first wholly filled with mercury, and then inverted in a cup filled with the same fluid; the pressure of air upon the fluid in the cup maintains a column of mercury in the tube of about 30 inches height; this column varies with the pressure of the atmosphere; if the atmosphere is heavy the column rises, and if light it falls. As we ascend up into the air the pressure decreases, and the Barometer, if taken to higher stations, falls and indicates the pressure of the air there; it is applied for the admeasurement of heights of places above the sea level.

The Thermometer is an instrument made up of a tube of glass sealed up at one end, and at the other end having a bulb; the bulb, together with about one-third of the tube is filled up with mercury; this tube is fixed in a frame of wood upon which degrees are marked; there are three kinds of scales in use with regard to the Thermometer, viz. of Fahrenheit, of Röemer, and of Celsus. Now mercury expands with heat, so that when the instrument is placed in a heated room the column of mercury rises, and when in a cool place it falls; thus the Thermometer indicates the temperature of the atmosphere at any place. Besides this it is applied for finding the heights of mountains by the boiling of water at their tops.

Water boils at 212° of Fahrenheit on the earth's surface at the sea level, but for every 530 feet that we ascend up, it boils at one degree less, thus the height of mountains can be ascertained. The principle of the action of the Thermometer is the equal and uniform expansion of mercury.

The Syphon is an instrument for taking water from a higher level to a lower one; it consists of a bent tube of glass, one limb being longer than the other, its smaller limb is immersed in the fluid which is to be brought from the higher level to a lower one, and the fluid is discharged from the longer limb.

Let P be the pressure of atmosphere upon the surface of the fluid and p′ the pressure of atmosphere in the discharging limb and p that of the air in the other, then the condition of the action of the Syphon is P — p less than P — p′, hence the Syphon must have a longer limb for discharging the fluid than for raising it.

Q. What is high pressure steam. Does it possess any property similar to that of metals in the incandescent fluid state?

A. High pressure steam is steam of upwards of 250° of Fahrenheit; *i. e.*, the steam produced by the water when the Thermometer plunged in it indicates more than 250° is called high pressure, it is so called because it exerts a pressure per square inch greater than a steam of 250° would exert. Such steam does not scald like metals in their incandescent state. It is applied to produce motion, or as a

motive power in the steam engine. It is expensive but not as dangerous as steam of low pressure and therefore it is convenient to use it.

Q. How much gold and silver, respectively, are contained in a mass of the compound metal, weighing in air 10·25 seers, and in water 9·645 seers. Is the result strictly accurate; and if not, why?

A. Here, the specific gravity of the compound

$$= \frac{10{\cdot}25}{10{\cdot}25 - 9{\cdot}645} = \frac{10{\cdot}25}{{\cdot}605} = 16{\cdot}9$$

Now let x = weight of gold in it

and y = that of silver

then $x + y = 10{\cdot}25$ ..... (1)

$19x + 107 = 16{\cdot}9 \times 10{\cdot}25$ ..... (2)

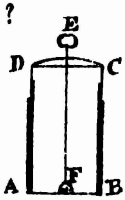
The solution of these equations give

$x = 7{\cdot}77$ and $y = 2{\cdot}44$ seers.

Q. Describe the method, and mention the principles involved, in ice-making at Agra. How is it that it fails in cloudy weather?

A. In the cold weather at Agra, the people or the manufacturers of ice first lay layers of straw over the ground, and over them place shallow earthen vessels full of water: this is done in the evening. In the morning they find the water frozen or in a solid state; *i. e.*, ice is made of it. The sky being clear in the night, cold descends from the sky, and there being no communication of heat from the ground with the earthen vessels (because straw is laid beneath them, and the communication is prevented) the whole water gives up its heat, and it is frozen by the morning. But when it is cloudy, the heat of the water during night is not exhausted, and the manufacture fails.

Q. What is the Leyden Jar, and why so named?



A. The Leyden Jar is a porous jar of porcelain, it is so called because it was invented at Leyden. It has a coating of tin, both inside and outside, it also has a rod of brass with a knob of the same metal at one of its ends: the other end communicating with the interior coating of the Jar. In the figure A B C D is the vessel or Jar, the thick lines represent the coating, E F the rod, E the knob. When the prime conductor of the electric machine is connected with a chain of brass or iron with the knob, positive electricity is filled in the interior of the Jar, and a communication being in the

same manner made with the outer coating and the negative electricity gatherer of the machine, negative electricity is collected on the outer surface of the Jar: now when a metallic communication is made with the outer coating, and the knob with a glass handle having moveable rods at both ends, the Jar is discharged and a spark of light is seen. If a human being were to hold a chain connecting with the outer coating in one of his hands, and that connecting with the knob in the other, he would sustain a shock.

Q. Describe the needle Electric Telegraph, and show the importance of the invention.

A. The needle Electric Telegraph consists of a plate of wood, in the middle of which is a hank of wires, which encloses a large needle; when communication is made with the battery by means of a disc, and wires, the needle is deflected from its state of rest. It is deflected from right to left when the current of electricity is made to pass below and above the needle, and from left to right when the current is made to pass above and below it. This is effected by means of a circular disc of copper which has a piece of wood between the two segments of copper, and thus separates them; it has four clamps to it to which the wires of the battery are connected. The movements of the needle are supposed to represent letters of the alphabet, for instance the motion from left to right is supposed to indicate A, that from right to left B, two motions from left to right indicate C, and so on, and by this means intelligence is conveyed between places thousands of miles distant from each other. The battery and the disc are kept at one place, and the needle at another, and communication is made between them by means of wires. When the person present near the battery wants to convey any intelligence to the person at the needle, he at first causes a bell to be struck at the place where the needle is, by means of electric battery, in order to warn his associate, and then he commences the movements of the needles, and thus any intelligence or speech is conveyed from one place to another in an instant. Such telegraphs are used upon railways.

Q. Is there reason to believe that all substances are subject to the influence of voltaic electricity; and if so, is there any and what difference in its manifestations in them?

A. There is reason to believe that almost all substances are subject to the influence of voltaic electricity. Some manifest it to a greater degree, others to a less, some give very striking manifestations of electricity in them, and some but very few and very small. For instance the human body is subject to the influence of electricity, the skin of a cat and so on. Some animals also possess electricity, as for instance the Torpedo, or electric Eel and the Gymnotus. Almost all such substances are classed under two great heads, viz., magnetics and diamagnetics, the effects of the latter being contrary to those of the former.

Essay by Motee Lall of the Dehlie College, written for Sir Herbert Maddock's Prize.

اِن دنوں هندوستان میں اهل علم اور فهم کون کون پیشه عمده اور فائده بخش اِختیار کرسکتے هیں اور هر ایک سے کامیابي کے واسطے کیا کیا تعلیمیں اور پهر کیسي محنت اور کوشش درکار هی

في زماننا هندوستان میں پیشهور کے واسطے وه آرام اور چین حاصل هی که پهلے کبهي اُسے میسر نه تها * پادشاهان سابق هندوستان کا اِنتظام ایسا تها که پیشهور اور اهل حرفه خوش نهیں رهه سکتے تهے چنانچه اب بهي جهاں سرکار کي عملداري نهیں هی وهاں اکثر یهه بات پائي جاتي هی * چند روز کا عرصه هوا هی که ایک شخص نے کشمیر سے صاحب مهتمم دهلي گزت کو لکها هی که مهاراجه گلاب سنگهه والي جمبو دوشاله بافوں پر کشمیر کے بهت ظلم کرتا هی اور زمیندار بهي مصیبت میں پهسے هیں که اُنکي ایک فصل تو هضم کرلي اور اور زیاده اُنسے مانگتے هیں * یهاں هماري سرکار کا اِنتظام اِتنا اچها هی که یهاں هر پیشے اور هر صاحب پیشه کو اِطمینان خاطر حاصل هی اور فروغ هی پس زمانهٔ حال میں بسبب حسن اِنتظام سرکار اهل حرفه بهت خوش هیں اور یهه زمانه ایسا هی که اکثر لوگ صاحب علم اور فهم پیشه کرتے هیں اور اور زیاده کرینگے * پیشه دوطرح کا هوتا هی عمده اور فائده بخش فائده بخش پیشه کچهه ضرور نهیں که عمده هو مگر اِسمیں کوئي شک نهیں که عمده پیشه اکثر فائده بخش هوتا هی * هندوستانیوں کے واسطے بهت سے عمده اور فائده بخش پیشے هیں جنهیں وه اِختیار کرسکتے هیں *

اول پیشهٔ وکالت یهه پیشه عمده هی هماري غرض پیشهٔ وکالت سے فقط یهي نهیں هی که وکیل هونا بلکه اُصول قوانین مجاریهٔ سرکار سے واقف هونا اور خود قوانین سے واقفیت حاصل کرنا * اهل هند کے واسطے سرکار کی عملداري میں یهه نهایت اچها پیشه هی اور جو اِعزاز و اِکرام اِسکے واسطے هی وه اکثر کے واسطے نهیں وکیل سے صدرالصدور تک هندوستاني هوسکتا هی * اِس سے آگے في زماننا اور کوئي عهده هندستاني کےواسطے نهیں لیکن ایک بات عجیب معلوم هوتي هی که باوجودیکه صاحبان جج کي بڑي عزت اور اُنکا بڑا رتبه هی لیکن ایک طور سے صدرالصدور کو بهت اختیار حاصل هی حتیٰ که صاحبان جج کو وه اختیار نهیں بالجمله یهه عهده بهت معزز هی اور هندوستاني کو حاصل بهي هو سکتاهی درین صورت اِسمیں کوشش کرني چاهیئے * یهاں هم بیان کرینگے که ایسي کامیابي حاصل کرنے کے لیئے کیا کیا تعلیم اور کیا کیا کوشش اور محنت ضرور هی * جب منصفي کے واسطے امتحان مقرر هوا تو سرکار نے یهه اشتهار دیا که جو شخص بعد دینے امتحان کے لئیق معلوم هوگا اُسے عهدهٔ منصفي ملیگا اکثر اشخاص

نے امتحان دیا اور اکثر کو اسناد بھي حاصل ہوئیں لیکن اب یہہ حال ھی کہ بہت کم کو سند ملتي ھی باعث اِسکا یہہ معلوم ھوتا ھی کہ پہلے لوگ یہہ کام کرتے تھے کہ قوانین کو حفظ یاد کرلیا کرتے تھے اور جسکا حافظہ اچھا ھوتا تھا وہ امتحان اچھا دیتا تھا اور اُسے سند ملجاتي تھي اب چونکہ عہدہجات منصفي کي گنجایش کم ھی اب امتحان اور طریق پر لیا جاتا ھی اور فقط حافظہ سے کام نہیں چلتا اُصول قوانین سے واقفیت حاصل کرني بہت ضرور ھی * یہاں ایک بات لکھني بہت ضرور ھی اگر کوئي شخص یہہ چاھے کہ کسي پیشہ میں مجھے فروغ حاصل ھو علی‌الخصوص اِس مقام پر ھم پیشۂ وکالت کا ذکر کرتے ھیں تو اُسے زبان انگریزي ضرور سیکھني چاھیئے یہہ تو سچ ھی کہ جو قانون سرکار جاري کرتي ھی اُسکا ترجمہ فورا اردو میں ھوجاتا ھی اور ھر شخص اُسے پڑھہ سکتا ھی لیکن اِتنا غور کرنا نہایت ضرور ھی کہ جو بات اصل کے پڑھنے سے حاصل ھوتي ھی وہ ترجمہ سے نہیں نصیب ھوتي اور بعضے چٹھیات اور کنسٹرکشنز ایسے ھوتے ھیں کہ اُنکا ترجمہ دیر میں ھوتا ھی اور شاید نہیں بھي ھوتا اُنسے واقفیت حاصل ھوسکتي ھی * مگر ایک بڑا نفع زبان انگریزي کے جاننے سے یہہ ھی کہ اکثر کتب جو آئین کے باب میں ھیں اور جنکے پڑھنے سے ماھیت اور حقیقت آئین کي معلوم ھوجاتي ھی پڑھي جاسکتي ھیں اور یہہ علم قریب‌التکمیل حاصل ھوجاتا ھی بڑے بڑے وکلا کي صحبت میں بیٹھنا اور اُنسے حاصل کرنا یہہ بھي ضرور ھی اگر انسان کو اُصول قوانین سے واقفیت ھوتي ھی تو حسن و قبح ھر قانون سے آگاھي حاصل ھوجاتي ھی اور اُنسے رعایا کو بہت نفع پہنچ سکتا ھی فقط قوانین کے حفظ کرلینے سے کام نہیں چلتا اُنکو پڑھے اور اُنکي وجہہ وضع دریافت کرے اور غالب ایسا معلوم ھوتا ھی کہ چند عرصہ میں اکثر مراتب قوانین کے اُنسے بے سوچے اور بغیر بہت تامل کے معلوم ھوجاوینگے * اِن سب باتوں سے دو نفع ھیں ایک تو یہہ کہ واقفیت اور دوسرے یہہ کہ ترقي عہدہ مگر یہہ بات کبھي نہ بھولني چاھیئے کہ اِن سب باتوں سے کچھہ نہیں ھوسکتا جب تک کہ طبیعت آدمي کي اچھي نہو یعني تربیت اُسنے اچھي نہ پائي ھو ھر پیشہ میں اور خصوصا ھر پیشہ میں کامیاب ھونے کے واسطے یہہ باتیں نہایت ضرور ھیں اول راستي دوم کفایت شعاري سوم محنت چہارم خوف لوگوں کي راے کا پنجم اِیمان ششم اِنصاف اور فقط اِس سبب سے انصاف کو عزیز رکھنا کہ اِنصاف حقیقت میں اچھا ھوتا ھی اور کسي غرض سے نہیں *

دوم پیشۂ طبابت اِس پیشہ کي خوبي میں کچھہ شک نہیں ھی اِسکي خوبیوں کو بیان کرنا گویا ایسا ھی کہ کسي سے کہنا کہ میاں ھر صبح کو آفتاب نکلا کرتا ھی اب دیکھا چاھیئے کہ اِس میں کامیابي کے واسطے کیا کیا تعلیم اور کوشش ضرور ھی اِسمیں کوئي شک نہیں کہ مطب انگریزوں کا مطب یونان سے بہت بہتر ھی في زماننا ایسي تحقیقات کي گئي ھی کہ پہلے یونانیوں سے نہیں ھوئي تھي اور نہ ھوسکتي تھي ھر بات کے واسطے ایک وقت مقرر ھوتا ھی جیسا کہ پودا بڑھتے بڑھتے درخت ھوتا

هی اِسیطرح علم کو بھي ایک دفعہ هي فروغ حاصل نہیں هوتا بلکہ بتدریج علم کو یہہ رتبہ ملتا هی زمانۂ حال میں تشریح کو بہت فروغ هوا هی * اور علم کمسٹري سے علم طب کو بہت فائدہ هوا هی علم کمسٹري سے یوناني واقف نہ تھے اور نہ اهل عرب وغیرہ اِس علم کو جانتے تھے آج تک هزارها مردے لندن اور کلکتہ وغیرہ میں تراشے جاتے هیں اور روز نئي باتیں دریافت هوتي هیں اگر علم طب میں فروغ حاصل کرنا منظور هو تو زبان انگریزي میں اُسے سیکھنا چاهیئے اور یہہ نامیکہ ن معلوم هوتا هی کہ بے سیکھنے زبان انگریزي کے اِس علم میں اچھي دستگاہ حاصل هوجاوے بہت سي ایسي ادویات هیں اور ترکیبیں اُنکے ملانے اور الگ کرنیکي اِتني هیں اور ایسے هیں کہ وہ زبان اُردو یا فارسي یا عربي میں نہیں معلوم هوسکتیں اور ادا نہیں هوسکتیں پس معلوم هوا کہ زبان انگریزي کا سیکھنا اِسواسطے بہت ضرور هی * هندوستان میں یہہ علم کلکتہ میں سکھایا جاتا هی اور ایک مدرسہ جسے میڈیکل کالیج کہتے هیں وهاں واسطے تعلیم طلباء علم طب کے بنا هوا هی وهاں یہہ علم پڑھایا جاتا هی اور مردے تُراشے جاتے هیں اور اُستاد آپ مردے تراش کر دکھاتا هی اور پھر طلباء سے بھي ترشواتا هی یہہ بات بہت ضرور هی اِسواسطے کہ جب تک تشریح سے واقفیت نہیں هوتي تب تک بیماریونسے واقفیت حاصل هوني محال * اِس علم میں اچھي دستگاہ حاصل هونیکے واسطے یہہ ضرور هی کہ اکثر بیماروں کو دیکھے اور اُنکا علاج هوتے هوئے دیکھے اور نسخہ جات کو ملاحظہ کرے * یہہ علم بطریق احسن لندن میں آسکتا هی وهاں بڑے بڑے اسپتال هیں کہ جہاں سیکڑوں هزاروں بیمار پڑے هوئے هیں اور سب طرح کي بیماریاں وهاں موجود هیں مثلا بہت سے ایسے شخص هیں کہ وہ مرض بخار میں گرفتار هیں اُنمیں بھي یہہ تفریق هی کہ ایک ایسا هی جسے ایک هي دن بخار آتے هوئے هوا دوسرا ایسا هی جسے دو دن هوئے تیسرا ایسا هی جسے تین هوئے اور علیٰهذاالقیاس ایسے بیماروں کے دیکھنے سے یہہ نفع هی کہ یہہ معلوم هوجاتا هی کہ بخار کس درجے میں کیسا هوتا هی غرض کہ علم کمسٹري سے واقف هونا اور علاج کرنا اور نسخوں کا دیکھنا اور بیماروں کو بغور ملاحظہ کرنا اور اُس بیماري کو بڑھتے گھٹتے دیکھنا یہہ سب باتیں ضرور هیں * ماورائے اِسکے جتني کتابیں اِس علم میں زبان انگریزي اور عربي وغیرہ میں هیں اُنکا پڑھنا چاهیئے * ایک اور بات یہہ ضرور هی کہ فورا بیمار کي خبر لیني اور تساهل نکرنا اور چست و چالاک رهنا چاهیئے اِسواسطے کہ فرض کیا کہ ایک حکیم بہت اچھا اور حاذق هی اور تشخیص اور علاج اُسکا دونو اچھے هیں لیکن بہ سبب غفلت یا سستي کے یا کسي اور سبب سے وہ بیمار کي خبر جلد نہیں لیتا تو کوئي اُسے نہ پوچھیگا اور ایک اور طبیب کے پاس جو اِتنا اچھا نہیں هی لیکن خبرگیري بیماروں کي خوب کرتا هی اور بہت توقیر اور دلداري اور دلجوئي سے معالج هوتا هی جایا کرینگے اور اُس سے علاج کرواوینگے جیسا هم اُوپر بیان کرچکے یہاں بھي بیان کرنا ضرور هی کہ سوائے اِن سب باتوں کے راستي اور اِیمان وغیرہ بہت ضرور هی نہیں تو خاک فروغ نہیں هوگا *

سیوم سول اِنجنیرانگ یہہ پیشہ چند روز سے هندوستاني کے اختیار کرنیکے لائق هوگیا هی پہلے یہہ عہدہ هندوستاني کے واسطے نہیں تھا مگر اب نواب لفٹننٹ گورنر بہادر نے ایک مدرسہ روڑکي میں مقرر فرمایا هی اور وهاں طالب‌العلموں کو یہہ کام سکھایا جاتاهی اور بعد اُسکے کہ وہ اُسي مدرسہ میں امتحان دیکر لائق عہدہ کے تصور کیئے جاتے هیں تو وہ سب اسسٹنٹ سول اِنجنیر هوتے هیں * اِس عہدہ‌دار کو یہہ کام کرنا پڑتا هی کہ مکانات سرکاري تعمیر کرنا یا پل کسي دریا پر یا ندي پر باندهنا یا نہر کھدواني اور اور بھي کام هوتے هونگے * یہہ پیشہ بہت معزز هی اور اِس میں یہہ ضرور هی کہ علم ریاضي سے واقفیت رکھتا هو اور اُس علم پر عمل بھي رکھنا ضرور هی اگر فقط علم هي هی تو کچھہ کام نہیں چلتا عمل اُس علم پر هونا بہت ضرور هی ایسا بھي هوتا هی کہ فقط عمل هي عمل رکھتے هیں اور یہہ کام دیتے هیں وجہہ اِسکي یہہ هی کہ بموجب قواعد علم ریاضي کے اُس کام کو کردیتے هیں مگر جب تک علم نہو تب تک کمال نہیں حاصل هوسکتا * اِس پیشے والے کو کمپاس اور اور آلات پیمایش کا کام میں لانا جاننا چاهیئے اور نقشہ مکانات وغیرہ کے کھینچنے آنے بھي بہت ضرور هیں اکثر اوقات دریاؤں پر پل بنانے میں بڑي بڑي طبیعت صرف هوتي هی اور اپني طبیعت سے باتیں نکالني پڑتي هیں مشق اُن معاملات میں هوني چاهیئے * یہہ عہدہ سرکاري هی لیکن اگر کسي سب‌اسسٹنٹ سول اِنجنیر کا طریق اچھا هو اور اِیماندار اور نیک چلن هو تو وہ بہت کچھہ حاصل کرسکتا هی اِس طرح پر کہ اگر وہ حقیقت میں لائق اِعتماد کے هوگا تو اکثر لوگ اُسکي معرفت اپنے کام بنوائینگے اور اُسکا حق اُن سے ملاکریگا ولایت میں یعني انگلستان میں اِس پیشے کي بڑي قدر هی وهاں نہیں ایسي جگھہ اور ایسے مقامات پر کھودي گئي هیں کہ اگر اُسکا بیان کیا جاوے تو ایک دفعہ محال جاناجاویگا اگر ولایت میں جاکر اِس علم کو سیکھیں تو بیشک یہاں بہت فروغ حاصل هووے یہہ عہدہ اُسي شخص کو مل‌سکتا هی کہ جو انگریزي جانتا هو *

چہارم تجارت تجارت هندوستان میں همیشہ سے هوتي هی اور یہہ پیشہ کچھہ نیا نہیں * تجارت دو طرح کي هوتي هی ایک اندروني اور دوسري ممالک غیر سے هندوستان میں یہہ دونوں تجارتیں پہلے تھیں اور اِس ملک کا مال فرنگستان تک پہنچتا تھا لیکن تجارت سابق و حال میں بہت فرق هی اب بسبب عملداري سرکار دولتمدار تجارت اندروني بھي بہت زیادہ هوگئي * تجارت اندروني دو طرح سے بڑھتي هی اول انتظام خوب دوم کثرت و ارزاني باربرداري * سابق میں هندوستان میں ایسا اندهیر تھا کہ دن دیئے بیوپاري لٹتے تھے یہاں سے کالکا تک کہ قریب چھہ سو کوس کے هی تھوڑے سے دن هوئے کہ پچاس ساٹھہ آدمي مسلح اور اکھٹے هوکر جاتے تھے نہیں تو مجال نہ تھي کہ کوئي شہر سے باهر قدم رکھے اور سڑکیں وغیرہ نہ تھیں

جس سے باربرداري ميں کم صرف هوتا اب جابجا سڑکيں بنگئي هيں اور ايک سڑک آهني بهي طيار هونيکو هی نهريں گنگا ميں سے کهودي جاتي هيں اور هر طرح کي آسايش هونيوالي هی * تاجر کو يهه باتيں ضرور هيں اول روپيه اِس سے يهاں کچهه غرض نهيں * دوم تاجر کو ضرور واقف هونا چاهيئے که ايک شهر دوسرے شهر سے کتني دور هی اور وهاں کيا چيز مطلوب هوتي هی اور ميں اپنے شهر سے کيا بهيج سکتا هوں اور ميرے شهر ميں کس چيز کي ضرورت هی اور وه کهاں سے نفع سے هاتهه آسکتي هی يهي واقفيت اُسکو ممالک بيگانه سے هوني چاهيئے * سوم اِيمانداري سوداگر کو نهايت ضرور هی نهيں تو ويسے ويسے کوڑي کے تين تين کوئي نه لے * چهارم توجهه اپنے کام کي طرف پنجم کفايت شعاري جو شخص کوئي پيشه اِختيار کرے اُسے نهايت ضرور هی که کسي اهل پيشه کی شاگردي کرے ولايت انگلستان ميں يهه اکثر دستور هی اور اُسکو اي‌پرنٹس کهتے هيں چند روز تک ايک ميعاد مقرر هوجاتي هی ايک لڑکا شاگردي ميں رهتا هی اور جب ميعاد معينه گذر جاتي هی تو اپني دوکان کهول بيٹهتا هی سچ يهه سوداگر کے حق ميں اِکسير هی سنتے هيں که انگلستان ميں يهه دستور هی که اگر ايک شخص کسي سوداگر کي دوکان پر کچهه جنس خريدنے جاوے اور سوداگر اُسکي قيمت مثلا سو روپيه کهکر نوے روپيه کو دے تو سوداگر کا اِعتبار جاتا رهتا هی * واضح هو که تمام رياست انگريزوں کي تجارت پر موقوف هی اور يهه قوم اپني تجارت کے باعث هي سے اِتنا اختيار رکهتي هی اور اِسيکے سبب سے انگريزوں کو اختيار حاصل بهي هوا پس اِس صورت ميں کچهه عجب نهيں که سوداگري کو اِتنا اچها اور معزز سمجهيں آج کل کلکته کے لوگ سوداگري سے بهت سے سارے هندوستان کے لوگوں سے زياده صاحب علم اور دولتمند هوگئے هيں نهيں تو بنگالي کي کچهه حقيقت نهيں جانتے تهے تجار کو اُن قوانين پر جو ممالک غير ميں درباب تجارت کے جاري اور جو اُنکے ملک ميں جاري هيں واقفيت حاصل کرني نهايت ضرور هی *

پنجم کشتکاري يهه پيشه نهايت مفيد هی اگر يهه پيشه نه هوتا تو دنيا ميں اِنتظام نه هوتا اور نه ابتک حارثي لوگ کثرت سے رهتے چنانچه مطالعهٔ تاريخ سے واضح هوتا هی که ممالک رومية کبری اِسي سبب سے غارت هوگئي که وحشيان ممالک شمالي کو کهانے پينے کو اپنے ملک ميں نهيں ملا * اکثر لوگ کهتے هيں که يهه پيشه بهت آسان هی اِسواسطے که وه ديکهتے هيں که اکثر کشتکار اور زميندار جاهل اور بيوقوف هوتے هيں مگر اگر غور سے ملاحظه کيا جاوے تو يهه پيشه نهايت مشکل هی تخم ريزي وغيره کا وقت جاننا چاهيئے يهه بهي جاننا چاهيئے که کب اور کتنا پاني کهيت کو ديا چاهيئے اور يهه معلوم هونا چاهيئے که کونسي زمين ميں کيا چيز زياده اور اچهي پيدا هوگي کهات وغيره کے خواص جاننے چاهيئيں اور اور سيکڑوں باتيں که جنکا جاننا ايسا آسان نهيں هی که جيسا لوگ خيال کرتے هيں * ديکها چاهيئے

کہ اِتنے عرصۂ بعید سے ہندوستان میں کھیتي ہوتي ہی لیکن ابھي تک یہاں کے زمینداروںکو معاملات نشتکاري اور آلات کشاورزي سے کماینبغي واقفیت نہیں ہی ہندوستان میں قلبہ‌راني بُرے طور پر ہوتي ہی اور یہاں ہل اچھے نہیں ہوتے * بعض لوگ یہہ کہتے ہیں کہ یہاں ایسے ہي آلات ناغي ہیں اِسواسطے کہ یہاں کي زمین اچھي ہی مگر یہہ عذر قابل پذیرائي نہیں معلوم ہوتا * زمیندار کو قوانین سرکار سے واقف ہونا نہایت ضرور ہی اگر زمیندار انگریزي پڑھا ہووے اور کتب انگریزي کي سیر کرے تو اُنسے نہایت فائدہ ہو اِسواسطے کہ ولایت میں جو نئي نئي ترقیاں روزمرہ ہوتي ہیں اُسے دریافت ہوں اور وہ اختیار کرے * ولایت میں ایلیکٹریسٹي وغیرہ کھیتوں میں کام آتي ہی اور اُسکے سبب سے فصل بہت اچھي اور جلد ہوتي ہی * علم طبیعي وغیرہ سے بہت نفع ہوتا ہی اِس علم کے سبب سے یہہ معلوم ہوتا ہی کہ جہاں درخت زیادہ ہوتے ہیں وہاں میہہ خوب برستا ہی اگر زمیندار کو یہہ معلوم ہو تو وہ اپنے کھیتوں کے ڈول پر درخت لگا دیا کرے اور اُسکو دوہرا نفع ہو ایک تو یہہ کہ پاني خوب پڑے دوسري یہہ کہ درخت کي لکڑي مفت اُسکے ہاتھہ آوے * زمیندار کو اور تاجر کو اپنے کام کے لائق لکھنا پڑھنا اور حساب ضرور جاننا چاہیئے اگر یہہ نہیں جانے تو اُسکے واسطے بڑي خرابي ہی چنانچہ ہم دیکھتے ہیں کہ ہمارے ملک کے زمیندار جو کچھہ لکھنا پڑھنا نہیں جانتے مصیبت میں رہتے ہیں ہر گانو میں ایک پٹواري ہوتا ہی کہ وہ حساب گانو کا لکھا کرتا ہی اور گانو میں کئي حصہ‌دار ہوتے ہیں جسکي طرف یہہ پٹواري ہوگیا اُسکي چڑھہ بني اکثر زمیندار پٹواري کے ہاتھوں سے نالاں ہیں اور ہمیں خوب یاد ہی کہ ایک ضلع میں کئي پٹواري اِسیواسطے مارے گیئے *

ششم کارخانہ‌داري اِس سے ہماري یہہ غرض ہی کہ ایسي دوکان مقرر کرني جہاں کپڑا وغیرہ بنا جاوے اور بہت سي چیزیں طیار ہوں مثلا بگھي وغیرہ اور علی‌ہذالقیاس انگلستان میں سیکڑوں کارخانے ہیں جہاں سب طرح کا اسباب بنتا ہی مالک کارخانہ بننے کے واسطے بہت سي محنت اور تعلیم ضرور ہي * اول مالک کارخانہ کو چاہیئے کہ کلیں طیار کراوے اور اُنسے خوب واقفیت رکھتا ہو یعني ہر کل کے عمل اور پرزوں وغیرہ سے آگاہي رکھتا ہو اُسے یہہ بھي جاننا چاہیئے کہ کس جگہہ کونسا کارخانہ زیادہ چمکیگا یہہ کچھہ ضرور نہیں ہی کہ ہر کارخانہ ہر جگہہ چل نکلے چنانچہ ولایت میں شفلیڈ چھري تلوار وغیرہ یعني لوہے کا کام خوب بنتا ہی وجہہ اُسکے یہہ ہی کہ وہاں کوئلا بہت ملتا ہی اور لوہا بھي ملتا ہی اور جگہہ ایسا اچھا کام نہیں بنتا یہاں کے لوگوں کو طیاري کارخانجات میں تبھي نفع ہوگا جب یہاں سے کچھہ لوگ انگلستان کو جاویں اور وہاں چند مدت تک رہیں اور وہاں کسي کي شاگردي میں رہکر کچھہ سیکھہ آویں وہاں سیکڑوں ایسي ترکیبیں اور ہزاروں ایسي تدبیریں ہینگي کہ یہاں کبھي خواب میں بھي نظر نہیں آتیں اور نہ

یہاں کسیکو اِسطرح آسکتي ھیں کہ ایک کاریگر وھاں کا کوئي چلا آوے * والي مصر نے چنانچہ ایسا ھي کیا کہ کچھہ لوگ اپنے ملک کے انگلستان کو بھیجے اور جب وہ خوب وھاں کامل ھوگئے اُنکو طلب کرلیا اب وھاں تو یہہ نقشہ ھی کہ وہ لوگ جو انگلستان اور فرانس سے سیکھہ کر آئے ھیں اِتنے ھي لئیق اور کامل ھیں جیسے کہ اھل انگلستان اور فرانس کے باشندے خود ھیں اور یقین ھی کہ اگر دو تین بار اِسي طرح سے اور لوگ اُس طرف بھیجے جاوینگے تو تھوڑے سے عرصے میں مصر کے لوگ بھي ایسے ھي کار خانے بنالینگے جیسے ولایت میں اب موجود ھیں * کپڑا جو انگلستان سے یہاں آتا ھی کچھہ ایسا بھي ھی کہ یہاں کے لوگ ویسا بن لیتے ھیں مثلا چند ایک ایسے ھیں کہ وہ نینو سینو بن لیتے ھیں لیکن بہت سے اور کپڑے نہیں بنے جاتے یقین ھی کہ اگر یہہ لوگ ولایت کو جاویں تو بیشک وھاں دیکھہ دیکھکر بہت کچھہ سیکھہ آویں اور پھر یہاں خوب کپڑا بنا جایا کرے * اصول علم کفایت شعاري یعني انتظام مدن سے بھي واقفیت کار خانہدار کو ضرور ھی* چونکہ زبان انگریزي کو بہت رواج ھوا ھی اور جمیع اقوام و اقالیم کے علوم اِس زبان میں موجود ھیں اِسواسطے ھم یہاں لکھہ دیتے ھیں کہ اگر کسي پیشہ میں فروغ حاصل ھونا غرض ھو تو زبان انگریزي بھي ھندوستانیوں کو سیکھني فرائض سے ھی *

ھفتم پیشۂ اِھتمام اخبارات کچھہ عرصہ سے ھندوستان میں اخبارونکا بازار بہت گرم ھوگیا ھی اور اب بہت ایسے ایسے لوگ ھیں کہ وہ فقط یہي پیشہ کرتے ھیں ھمارے اِس شہر میں کئي ایسے شخص ھیں کہ جو یہي پیشہ کرتے ھیں * اِھتمام اخبار کا بہت مشکل ھی اور ایک مہتمم کا یہہ قول ھی کہ کار اھتمام لڑکوں کا کھیل نہیں ھی تاکہ اِس پیشہ میں فروغ حاصل ھو مراتب مندرجۂ ذیل کا لحاظ رکھنا بہت ضرور ھی اور اُسمیں بہت کوشش اور محنت کرني لازم ھی * اول تو مہتمم اخبار کو اکثر علوم سے واقف ھونا چاھیئے اور اُسمیں ایک طور کي آزادي اور عزم ھونا چاھیئے اور شجاعت باطني بھي بہت ضرور ھی ھم شجاعت باطني اُسے کہتے ھیں کہ حق کا پابند ھونا اور راستي پر عمل کرنا اگرچہ اُسکے خلاف اکثر لوگ ھوویں اور اُنکي راے کو اِس معاملہ میں ناچیز سمجھنا اور اپنے کام سے کام رکھنا * دوم اکثر اخبارات انگریزي و فارسي اور اُردو کو دیکھنا اور خیال رکھنا کہ کہاں کیا ھو رھا ھی تاکہ اور لوگوں کے برابر رھیں اور جو جو کچھہ نئي نئي باتیں معلوم ھوویں اُنھیں ذھن میں رکھے * سوم ھمیشہ راستي دوست ھونا اور فریب اور دغابازي کو جائز نکرنا * ایک مہتمم اخبار لکھتے ھیں کہ مہتمم اخبار کو چاھیئے کہ اگر ایک شخص سے کوئي حرکت ناشایستہ سرزد ھو تو اُسے خوب ذلیل کرنا چاھیئے تاکہ اور لوگوں کو عبرت ھووے عموما ایک بات کو لکھہ دینے سے اِتنا نفع نہیں ھوتا جتنا کہ اِسطور پر لکھنے سے ھوتا ھی * چہارم ھندوستان میں اخبار جاري کرنے میں یہہ بھي لحاظ رکھنا چاھیئے کہ فقط خبروں سے کام نہیں چلتا ھی یہاں لوگوں کے طبائع اور

اخلاق بدلنا چاهیئے اور یهه فقط مضامین علمي و غیره سے هوسکتا هی البته ایسا اخبار کم جاري هوگا یعني خریدار ایسے اخبار کے کم هونگے لیکن با وجود اُسکے یهه لحاظ تو ضرور رکهنا چاهیئے * یهاں کے اخبار ایسے هونے چاهیئیں جیسے لنڈن میں سپیکٹیٹر تها اور سب جانتے هیں که لنڈن میں اُس اخبار کے شائع هونے سے کیا نفع حاصل هوا هی اور هوا تها * پنجم مهتمم اخبارکو فرض هی که اکثر بلاد و امصار میں واقفیت پیدا کرے اور اکثر لوگونسے ملا کرے اور اُنکے طرق و اطوار کو دیکهے اور بے تامل بحکم شجاعت باطني بري چیز کو برا کهے اور اچهي کو اچها * هم اُوپر لکهه چکے هیں که زبان انگریزي کا سیکهنا هر پیشے کے واسطے اچها هی اِسواسطے یهاں تکریر سے اُسے پهر لکهنا کچهه ضرور نهیں لیکن اِتنا لکهنا چاهیئے که اِس پیشے میں انگریزي کا سیکهنا جتنا اچها هی هر شخص کو بے تامل معلوم هو جاویگا فقط *

هشتم في زماننا بسبب رواج چهاپے کے علم کو بهت رواج هوا هی اور اب هزارها کتابیں بکتي رهتي هیں چنانچه اب چند اشخاص ایسے هیں که وه کتابیں تالیف یاتصنیف کرکے بلب نان پهنچتے هیں اگر یهي حال رها تو یقین هی که تهوڑے سے عرصه میں یهه بهي ایک خاصا پیشه هوجاویگا *

نهم هم اب یهاں پیشهٔ وکالت کا ذکر کرتے هیں یعني پیشه وکلاء کچهري کا اب سرکارنے ایک حکم جاري کیا هی که بے امتحان کوئي وکیل مقرر نه هو یهه حکم حقیقت میں بهت اچها هی اور لائق تعریف هی لیکن یهه بات عجیب معلوم هوتي هی که اکثر لوگ منصف هوجاتے هیں حالانکه وکلاء اُنکي کچهري کے اُنسے اچهے هوتے هیں چونکه وکلاء کو زیاده تجربه اور مشق هوتي هی اِسواسطے اگر ایسا هوتا که وکلاء میں سے منصف هوا کرتے تو بهت اچهے هوتے مگر یهه ایک جمله زیاده هی وکلاء کو قانون میں واقفیت خوب رکهنے تو لابدي هی مگر اُنکو اور کئي باتیں چاهیئیں * اول وکلاء کو یهه نهیں چاهیئے که حکام سے ڈرکر اپنے موکل کے مقدمه کي پیروي نکریں اور اُسکو تباه کردیں * دوم وکلاء پر فرض هی که اپنے موکل کے مقدمه کي کماحقه پیروي کریں مگر یهه همیشه لحاظ رکهیں که جهوٹے مقدمه میں پیروي نکریں تاکه نه اُنکے نام میں فرق آوے اور نه واسطے روپیه کے جادهٔ راستي کو چهوڑ کر جهوٹ کي طرف مائل هوں * سوم وکلاء کو لازم هی که اپنے موکل کے ساتهه رهیں اور یهه نهیں که طرفثاني سے ملجاویں *

اب هم یهاں اِس مضمون کو ختم کرتے هیں اور بهت سے پیشے هیں جو هندوستاني کرسکتے هیں مگر یهه پیشے جو اُوپر بیان کیئے گئے ایسے هیں که اهل علم و فهم اِختیار کرسکتے هیں *

Revised Translation of the above prepared in the Dehlie College.

"On the different liberal professions and useful occupations, open to the natives of India, and the best mode of succeeding in each, whether as regards preliminary training or subsequent exertion."

In the present day, traders and men of business throughout India enjoy comforts and advantages such as it was not their fortune to possess formerly. Under the Native Governments they never prospered, and the rule holds true to the present day in those parts of India which are governed by native princes, and to which British power and influence do not extend. In a recent issue of the *Dehlie Gazette*, a correspondent from Cashmere asserts that the Maharajah Golab Sing oppresses the shawl weavers and zemindars to such an extent that they are in utter despair. This is too often the case in Native States; while under British rule all classes enjoy security, and trades and professions generally flourish.

When advantages such as these have been placed within the reach of the trading and manufacturing classes, a general desire to enter into such speculations is of course generated, and we accordingly find that many natives of education and learning have already done so.

Professions and occupations are either liberal or useful. Useful occupations may not be liberal, but liberal professions are generally useful. Many of either class are open to the natives of India.

The profession of a Lawyer is a liberal one. By a Lawyer I do not mean only a pleader in Courts, but he who studies law as a profession, and is well versed in the laws of his country as well as in the principles of legislation. In the British dominions, this profession is the best and most honorable. From a common pleader in the Courts a native can rise to be a Principal Sudder Ameen, the highest post to which he can attain. There seems however a very singular anomaly in the judicial department, that though the Zillah Judge is an officer of higher rank and position than a Principal Sudder Ameen, the latter is possessed of greater power than his superior. The appointment is one of high respectability, and the hope of attaining to it leads many to enter this line of service.

I will here mention how success can be best achieved in this department. No person is eligible as a Moonsiff without having passed an examination in the Regulations and Laws by which the Country is governed. This examination was at first easy; but has now apparently become more difficult, and many fail in passing it. Originally little more was required from candidates for Moonsiffships

than that they should commit to memory the regulations without much knowledge of the spirit, but now that vacancies are more rare, they are expected to possess higher qualifications than before; mere good memory is of no avail, but a knowledge of the principles of legislation demanded. I may here mention that to insure success in any profession, (and in this more particularly) a knowledge of the English language will be very serviceable. It is indeed true that all new regulations are immediately translated into the Vernacular languages for general information, but in all cases it is far better to study the original than the translation, even if it were not the case that much useful information is left untranslated, and to this access cannot be had unless through the medium of English. But the chief good that is to be derived from a knowledge of the English language is the facility which it affords for the study of numerous works in jurisprudence in that language from which the most perfect knowledge of the principles of law can be obtained. He who wishes to succeed in the law should associate with others of the same profession, and study the principles of legislation, which enable us to judge of the good or evil tendency of particular laws. To learn the written laws by rote is of little value. The reason for their compilation should be sought after, and he who does so, will in a short time become a proficient in expounding them. Attention to these maxims will secure proficiency and promotion, but it must be accompanied by the moral virtues, love of truth, frugality, industry, regard for public opinion, conscientiousness, and love of justice for its own sake.

The study of medicine is beyond all doubt a liberal and very useful profession. To enumerate its benefits would be to tell a person, that the sun rises every morning in the East. It cannot be questioned that this science is more advanced among the English than it was among the Greeks. New discoveries have been made such as could not have possibly been made by the latter. Time is the great improver of all things, and as a plant takes sometime to grow up to a tree, so science attains to its eminence by gradations, and not at once. The knowledge of Anatomy has been much increased now-a-days, and Chemistry has done much towards the improvement of Medicine, but it is altogether a new science, and was unknown to the Greeks and to the Arabians. At present hundreds of dead bodies are daily dissected in London and Calcutta, and new discoveries are constantly being made. To be a good physician, a person should study that science as it exists among the English, and for this purpose the study of the English language is indispensable. There are numerous medicines for which there is no name in the Urdoo, Persian, or Arabic languages, and innumerable ways of compounding and exhibiting them, which can be learnt and understood only through the medium of English. In India, this science is taught in the Medical College at Calcutta. There, bodies are dissected and practical anatomy taught to the pupils; this is very necessary, for unless an intimate acquaintance with this branch of

knowledge is possessed by the pupil, it appears almost impossible that they should acquire a thorough knowledge of the various diseases, and the several ways they affect the human body. A student should also watch the patients with care and attention, and the various medicines given them. A knowledge of Medicine can be best acquired in London; for in that city there are large hospitals where hundreds of patients are under treatment, and all diseases under their various forms and in their different stages pass under review. In short, to insure success in this profession, it is necessary to be acquainted with Anatomy both in theory and practice, to observe various diseases in their different stages, and to acquaint yourself with the various prescriptions of the celebrated professors of this science. All the books in this science in the Arabic, English and Persian should be well studied. A physician should also be always ready to attend any patient that may wish to consult him, for if there be two physicians, and the more learned and skilful one is dilatory and careless, while the other, though inferior to him is always ready and attentive, the probability is that the latter will have a larger practice than the former. The moral virtues too are of equal avail in this, as in the legal profession.

The profession of Civil Engineering has become of late attainable by natives. Formerly it was not open to them, but the Lieutenant Governor, N. W. P., has now established a College at Roorkee, the pupils of which, after they have passed the prescribed examination, are appointed sub-Assistant Civil Engineers. This officer has to erect Government buildings, throw bridges across rivers, or dig canals as the occasion may require. The appointment is a very honorable one, and a thorough acquaintance with mathematics is necessary to qualify the candidate for it. He must be well versed in practical mathematics. A knowledge of the theoretical part of that science only will not be sufficient to enable him to perform his duties, without an acquaintance with that more practical part of it, which is in daily requisition. The knowledge of both makes a perfect officer. The sub-Assistant Civil Engineer should know the use of the Compass, Theodolite and other levelling and surveying instruments. He should be able to draw a sketch of buildings, &c. He may have to throw pucka bridges across rivers, and must therefore be well practised in his several duties. This is at present a Government appointment, but a sub-Assistant Civil Engineer, if he be well behaved, trustworthy and clever, will soon find his services in great demand and his profession a lucrative one. This profession is held in great esteem in England where Engineers have worked wonders. In that country, canals have been excavated where at first it was believed impossible to dig them, and should any one go to England, and return after having acquainted himself with all the great works there, he will be sure of great success. This situation at present is given to those only who know English.

The people of Hindoostan have been a commercial nation from very ancient times. The nation carried on with foreign countries an

extensive trade, and the goods of India reached as far as Europe. However, a great change has now taken place, and all foreign trade, since the subjugation of India, has come into the hands of the English nation. Its internal trade has however much improved, and its improvement denotes a better government and greater facility of transport. Before India became a province of the British empire there was neither security for property or life throughout the country. From Dehlie to Ralea, a distance of about 10 miles, the roads were unsafe, and people could not venture a step out of the city walls, unless 50 or 60 had assembled together and armed themselves for the purpose. Beoparees were plundered in broad day light, carriage was dear from the want of good roads. At present, the country is intersected with roads, and a railroad is about to be constructed. A canal from the Ganges is also in the course of excavation.

A merchant first of all must have capital. This however has nothing to do with the subject of the present Essay. He must be well acquainted with the distance of places and large cities, know the wants of different places and what he can best send out of his own town or city, and what goods can be most advantageously imported. Precisely the same kind of information he must possess with respect to foreign countries. Honesty is the best policy for the merchant and most necessary for him, for without it, he will never prosper. The merchant must also be always very attentive to his business, and he must avoid unnecessary expenditure. It is perhaps better that any person adopting a profession should bind himself apprentice, and at the expiration of his indentures set up for himself. This is a custom with traders in England. It is essential that a merchant should be honorable, and in England he loses his credit, if after demanding a price, (say a hundred rupees), for any article, he sell it for less, (say for 90 rupees). English power and supremacy owes its origin and existence to its extensive commerce, and we need not wonder that the nation should attach so much honor to the profession. At present, the people of Bengal are the wealthiest and most enlightened of the Indian nations; and this they owe merely to their large commercial transactions, for formerly the Bengalee was little esteemed in India. Merchants should also be acquainted with all laws relating to commerce that are extant in foreign countries and in their own.

Agriculture is the most useful occupation in the world; without it there would have been no Society and no Government. History bears ample testimony to the fact, that the mighty empire of Rome fell to pieces by the invasion of the northern barbarians who were ignorant of the art of agriculture, and who, unable to support themselves in their native land, poured down upon the empire and levelled it with the ground. Many are of opinion that this art is of very easy attainment, an opinion which has found currency owing to the ignorance and dullness of the agricultural classes. A little reflection will however show that it is not so easy an art as is imagined. The agriculturist

should know the time of sowing the seed, the exact period for irrigating the soil, and the length of time during which it should be so watered. He should know the nature of different soils, and what vegetables and plants suit them. He should know the properties and the qualities of the different manures, and a thousand other facts which are by no means easy to learn. This art has been in existence in India from very ancient times, but its implements are still of the rudest form, and the farmers know little of their profession. Some have argued that the implements in use are best adapted to the soil and climate, as the yield is very large. This argument however cannot be received without some hesitation. A farmer should be acquainted with the laws of the land. If he have a knowledge of English, he will derive great advantage from it by his increased knowledge of improvements and new discoveries. In Great Britain, the powers of electricity are called forth to assist and improve vegetation. The discoveries in Natural Philosophy are applied to promote the growth of vegetables. We know it as a fact that rain falls most plentifully in places which are covered with large trees. If the farmer knew this he would plant trees on the *douls* of his fields and doubly benefit himself; for in the first place more rain would fall, and in the next, he would in time possess a large quantity of timber at little expense. The farmer and the merchant should at least be able to read and write their accounts; for if they cannot do this they will never succeed. The zemindars of this country are very deficient in this respect, and are therefore in great poverty. In every village there is a putwarree, who keeps the village accounts, and when he sides with one or other of the co-partners of the village, quarrels and murders not unfrequently occur.

Many articles of use and ornament, such as cloth, are prepared in manufactories. England abounds with them. A manufacturer should first of all construct machines, and make himself acquainted with their several operations and parts. He should select a proper place for establishing his manufactory. It is not possible that every sort of manufacture should succeed in every place. In England, the best cutlery is made in Sheffield, where coal is very abundant, and iron found in large quantities. Persons establishing manufactories in India would succeed best, if they would go to England, and when they had learnt the art return to this country, for in England manufactures are carried on in a way unknown to the natives of India. The Viceroy of Egypt lately sent some of his subjects to England, and after they had become acquainted with the arts and manufactures, summoned them back to their own country. These persons are as good workmen as any in England and France, and if the same process be repeated, there can be no doubt, but that Egypt will produce just as good articles of commerce as England and France at present do, and that many manufactories will be established there. The native weavers of this country can weave some sorts of cloth that are imported from England, but they cannot imitate others. Should these men go to England, and

learn the business under English Masters of the art, they would no doubt weave as good and fine cloth as any in England. The master of a manufactory should also be acquainted with the principles of Political Economy.

Newspapers have recently multiplied in India, and some persons have taken up the occupation of an editor as a profession. In Dehlie there are some of this class. The duties of an editor are very difficult. To perform his work is no child's play. To insure success in this profession, it is necessary that the editor should be acquainted with the arts and sciences. He should be a man of spirit and independence and of moral courage, so that he may dare to brave the opinions of the world, when he is advocating truth and justice. He should read the several English, Oordoo and Persian newspapers and periodicals, that he may know what is passing in the different quarters of the globe, and should keep in mind the improvements and discoveries that are daily made around him. He should always be a friend to truth, and expose fraud and vice. It has been said that a public writer should expose by name any person guilty of fraud and vice, and hold him up as an example to others. General censure is of no avail. A newspaper published in the Vernacular in India should not only give news, but attempt to influence the moral character of the people. It should contain scientific and literary articles as well as news. Such a paper certainly has fewer subscribers, but nevertheless newspapers should be such. Native newspapers should be periodicals, similar to the "Spectator in London" and the advantages which that paper confers on the inhabitants of that city are known to all. Editors should also observe the manners and characters of the people around them, and by their moral courage expose abuses and vices, and advocate virtue. I have already said that for success in any profession a knowledge of English is most useful. I need not mention that the advantages which an editor will derive from a knowledge of that language are obvious to all.

The introduction of printing has given a stimulus to knowledge, and thousands of books sell in the country. There are some who have made it their profession to compile books. If a taste for science and learning increase, this profession will in course of time become both lucrative and useful.

The last profession I will mention is that of the Bar. No Pleader can now be appointed without having passed a previous examination. This appears very desirable, but it is strange that many are appointed Moonsiffs, who are less well versed than the Pleaders of their own Courts in the Laws and Regulations. As the Pleaders are men of great experience it would seem more advisable that the Bar should supply vacancies in the Bench. This has however very little to do with the present

subject. Pleaders should be well acquainted with the Laws, and should particularly observe the following maxims.

1st. They should never out of fear of their superiors, betray the cause of their clients, and so ruin them.

2nd. While they do their utmost to support the cause of their clients, they should take care that they do not favor a false, or litigious suitor, they will then avoid a bad name and the disgrace of forsaking truth and aiding fraud or falsehood.

I will not pursue the subject further. There are many other professions and occupations open to natives, but these are the principal of those which respectable and educated natives can adopt.

Questions in English History proposed to the Senior English Class, Dehlie College, and Answers by Mootee Lall.

Question. What was the disposition of the new government with regard to the reformation, and who were the principal promoters and opposers of that movement?

Answer. The duke of Somerset created protector to the king, always favored the reformation from his inmost heart. But when he became protector and held the reins of government in his hands, he openly favored the cause of the reformation. He took early opportunity to pre-possess the young prince in the cause of the reformation, and suffered no Roman Catholic tutors to approach the king. Cranmer the primate and many of the Council, either through interest or wish, promoted this movement. Gardener, Bonner and some other bishops were the principal opposers of the reformation.

Q. What causes led to the insurrections in different parts of England during the year 1549?

A. The introduction of the reformation was at first attended with very pernicious consequences. The new religion deprived many of the bishops of their revenues and lands, and the abbey lands were wrested from the monks and bestowed on the nobility and the lay gentry. The monks always gave their lands to their tenants at an undervalue, and the inhabitants in the country were able to borrow money from them at a lower rate of interest, and thus a mart was open to the villagers and the countrymen. But when the abbey lands were conferred on the nobility, the tenants were severely oppressed, and a

great number of them were turned out and reduced to beggary. The general progress of the manufactures in the continent of Europe, and in England itself, had created an extraordinary demand for wools. The science and the art of agriculture were in a rude state, and it was more profitable to tend a flock of sheep for wool than to employ the lands in unskilful agriculture. The nobility enclosed the commons and pastures, and so great was the national calamity occasioned by this extraordinary demand for wool, that a writer of that age says that "sheep in England were more ravenous animals than foxes and wolves." The people reduced to such straits took up arms against the gentry and the nobility. The protector by his endeavors to redress the people's grievances seemed to encourage them in their design. All the insurrections during this year began with a view to obtain redress against the enclosures, and when the people found themselves strong enough in numbers, they blended religion with this original cause. In such causes they were assisted by the gentry and by the nobility themselves.

Q. Why did Somerset resign the protectorship? what was his fate, and who succeeded to his power and authority?

A. During these insurrections the protector affected or rather wished to preserve his popularity with the people, and he ordered the Earl of Warwick to proceed against the rebels. This nobleman effectually suppressed the rebellions, and thereby acquired great power and fame in the opinion of the Council. The protector since his victory of Pinkey considered himself to be the absolute master, and he thought that every other person should yield to his authority in every respect and in every instance. Besides, he had made himself unpopular by divesting the abbeys and monasteries and pulling down churches to afford ground and materials for the erection of his magnificent palace on the Strand. The execution of his brother the admiral at his instigation had also rendered him odious in the eyes of the people. After his victory over the insurgents, the Earl of Warwick, who was a mortal enemy of the protector, associated himself with the Earl of Southampton, now again admitted into the Council, and having brought over the majority of the Council to his own interests, and secured the Lieutenant of the Tower, and the Mayor and Alderman of London in his favor, he wrote to the King (in the name of the Council) that they were the real Council appointed by his father to manage the affairs of the State, and that Somerset, whom they had appointed protector, not only never consulted them on any subject, but even acted contrary to their advice. The protector finding himself deserted by his followers and the men of rank, resigned his protectorship on a promise of good treatment. He was, however, sent into the Tower. The Earl of Warwick was now all in all, and he afterwards accused Somerset of high treason. Somerset was executed, having been found guilty of felony by the jury. Somerset was succeeded in his power and authority by Warwick.

Q. Relate the history of Northumberland's attempt to raise Lady Jane Grey to the throne.

A. During the malady of Edward VI., Northumberland persuaded that prince to change the succession as established by Henry. He represented to him in vivid colors, the evils which the new religion would experience in consequence of the accession of Mary to the throne. Besides he said, Mary was not considered legitimate by Henry and the nation, though the late King afterwards allowed her to succeed to the throne in his will. The objection of religion could not well have been applied to the Lady Elizabeth, but Northumberland had the artifice to persuade the prince that he could not with propriety exclude Mary from the succession without at the same time excluding Elizabeth also on the ground of illegitimacy. The Queen of the Scots, (he said) had been excluded by Henry VIII. from succeeding to the throne. The only heir therefore was the Marchioness of Dorset, and her heir, the Lady Jane Grey, a lady every way worthy of the throne. At the same time, Northumberland married his fourth son to Jane Grey, and having obtained the confirmation of the King and the Council to this arrangement, he proclaimed Lady Jane Grey, Queen of England.

Q. What were the first acts in Queen Mary's government?

A. After her accession to the throne, Mary to ingratiate herself with the people, pardoned many of those persons, who had opposed her elevation to the throne. Northumberland's ambition and crime however was so great, that he was not allowed pardon for his offences, and he was executed by the command of the Queen. The Lady Jane Grey and her husband were sentenced to be executed, but the sentence was not put into execution for the present. Gardener, Bonner and some other bishops as well as those noblemen, who had suffered during the late reign, were released and restored to their Sees and estates.

Q. Why was the marriage of the Queen so unpalatable to the people of England?

A. The Queen had fixed upon Philip of Spain, as the person to whom she intended to give her hand. The people and Parliament, though generally very obedient to the Queen, could not willingly consent to the marriage. Though the Emperor Charles V. of Germany, had offered very favorable terms, and the articles drawn up by him were for the advantage and grandeur of England, the people knew that the more Charles seemingly complied with the requests of the English, the less he would be willing to fulfil his promises. They thought that the marriage of Philip with Mary, would reduce England to be a province of Spain, and the Spanish Government was the most oppressive and unbearable. Philip was a barbarous, tyrannical prince, and

a bigotted Roman Catholic. The English expected nothing less at his hands than the total extirpation of the new religion.

Q. Mention the names of some of the most illustrious victims to the Queen's religious tolerance, and describe the martyrdom of Cranmer?

A. The most illustrious persons who fell victims to the Queen's zeal, were Rogers, Bishop Hooper, Sanders, Taylor, Ferrar and Cranmer. Although Cranmer did many services to the Queen during the reign of Henry VIII., still since he had labored to promote the reformation and signed Edward's will, which excluded Mary from succession to the throne, the Queen in the zeal of religion forgot his former services, and he was accused of high treason. Bonner and some others were sent to degrade him, and he was by flatteries and promises persuaded to subscribe to some articles presented to him by orders of the Queen. But this availed him nothing. The Queen intent upon both his death and disgrace sent him other articles to subscribe to and afterwards he was to be executed. Cranmer, perhaps secretly apprized of the Queen's intentions, refused to subscribe to any more articles, and even said he had erred in his conduct when he subscribed to the previous articles. He remained resolute in his determination, and he was ordered to be burnt alive. Cranmer suffered death with great fortitude and resolution, and having held forth his right hand in the flames was heard to exclaim "this hand has offended." Thus ended his life, admired by all, especially by the Protestant community.

Q. How long had the English held possession of Calais in Mary's reign, and under what circumstances did it fall into the hands of the French?

A. The English had been in possession of Calais for two hundred years, when it was re-taken by the French. Edward III. was eleven months in taking it, though at the head of a numerous and victorious army; but the English lost it in eight days. The Admiral Coligny secretly informed himself, that the English relying on the strength of the fort, and finding it inaccessible in winter, usually dismissed the garrison in that season except a few soldiers, and renewed it in spring. He employed engineers secretly to inform themselves of the fortifications, and examined the fort. These particulars gathered by Coligny were employed to his advantage by the Duke of Guise, who blockading Calais by land and sea, effected a breach in the walls of the fort, and thus recovered their long lost possession, which always gave command of the entry of France to the English.

QUESTIONS IN GIBBON'S ROMAN EMPIRE, PROPOSED TO THE SENIOR ENGLISH CLASS IN THE DEHLIE COLLEGE, AND ANSWERS BY MUKKHUN LALL.

QUESTION. Sketch the life and conquests of Zengis Khan, and mention the name by which he was known among the Europeans.

ANSWER. Zengis Khan was named Temugin. His father had reigned over thirteen hordes inhabiting the regions that lay to the north-east of the Caspian, and amounting to about thirty thousand families. After his decease, they refused to pay obedience to his infant son, and at the age of fourteen, Temugin fought a battle against his rebellious subjects but was defeated. But he, afterwards, rose superior to his fortune, and in his twentieth year had established his fame and dominion over the circumjacent tribes. The chiefs of the neighbouring state were brought under his rule, and the greatest men might tremble, when they beheld enchased in silver, the skull of the Khan of the Keriets, who under the name of Prester John had corresponded with the Roman Pontiff. He then marched towards China, besieged Pekin, which surrendered after a siege of two months, and conquered five northern provinces. The cruel murder and plunder of a Caravan by Mahomed Sultan of Kharism gave Zengis an opportunity of attacking his dominions. Mahomed met him at the head of four hundred thousand men, but was overcome by the superior talents of the emperor; he then distributed his troops in towns and cities, thinking that Zengis would be tired of so many blockades; but Zengis had brought with him a body of Chinese engineers skilled in the mechanic arts, and informed perhaps of the secret of gunpowder, and by their means he became master of the territories stretching from the Caspian to the Indus. He then subdued the territories, lying along the banks of the Tigris and Euphrates from their mouths to their sources.

Q. What was the origin of the Ottoman Empire, and under what circumstances did the Turks first gain a footing in Europe?

A. When Julalooddeen Sultan of Kharism was defeated by Zengis, his army was divided into two parts, the one marched to Jersesalem to join the besiegers, the other under Solyman Shah was incorporated into Aladin's army; but Solyman Shah being drowned in his passage of the Euphrates, his son Orthogrul took the command and became leader of four hundred families to the south of the Oxus. He was father of the Great Othman, who was founder of the Ottoman empire, and whose ambition led him to the conquest of Bithynia, which was left unguarded by Paleologus. The death of Azzaden, the last of the Seljukian dynasty put him in possession of the kingdom of Iconium.

The weakness and disunion among the Christian princes invited the Turks to Europe, some of the natives of which, instead of uniting in the common cause, joined without a blush the enemy of themselves and their country.

Q. Who were the Janisaries, with what object were they formed into a Corps?

A. The army of the Turks consisted of loose squadrons of cavalry and infantry, who followed their standard without pay, and in peace were all disbanded, so that a regular and standing army was necessary to follow the emperor's person always. Amurath, therefore, collecting every fifth European slave or prisoner taken in war, over whom he had a right, trained them to military habits, and taught them discipline and the religion of Mahomed. These, the slaves of the emperors, became afterwards their masters and exercised every authority over them.

Q. Give an account of the rise of Timoor, and relate the history of his conquests in India?

A. Timoor was of the family of Berlass; his fifth ancestor, Carashar Nervan had been the vizeer of Zagatai. His birth was cast in those periods of anarchy and confusion which announce the fall of an Asiatic dynasty, and open a new field to adventurous ambition. The Seljukian dynasty was no more, the descendants of Zengis were weak and pusillanimous, and Persia was divided among the petty chiefs or amirs. The people groaned under the oppression of Calmuck's and Gœtes, who made successive inroads upon Tartary, Samarcand and the adjacent countries. Timoor after many reverses of fortune at length overcame them. He then turned his arms against the armies of Persia, and had they united into a league, they might have repulsed the arms of Timoor; they stood separate and successively fell. But the prince of Fars or the proper Persia exposed him to great danger; he broke with three or four thousand men the main body of his forces, and Timoor himself received two weighty strokes of a scimetar. He stood firm as a rock, and laid the prince dead under his horse's feet.

When Timoor projected an expedition to India, his Generals were reluctant to march to that distant country, and dissuaded him from this enterprise, but Timoor maintained his own wish and with a large army followed the same track, which Alexander had trod in his march to India. He crossed the Punjab or the five rivers without resistance, and presented himself before the gates of Dehlie. Sultan Mahomed, king of Dehlie, met him without the walls with an army of forty thousand men and ten thousand horses, and a hundred and fifty elephants. Timoor made a ditch, and by means of fire repelled the elephants, and the inferior species of the men of India disappeared at

once from the field. Timoor made his entry into Dehlie, which was followed by a general massacre of the inhabitants. He then marched north-east and reached as far as Coupeli; his return was along the chain of mountains.

Essay by Motee Loll, 1st English Class, Dehlie College, on "the difference, as regards the liberty of the subject, between the British and the Mahomedan Governments."

The disciples of Mahomed were taught as their first duty to spread their religion by the sword. The prophet himself fought many battles to propagate the religion of the Koran, and his successors waged many a war on no better ground than the promulgation of their creed. Abubekr and Oomar, Oosmen and Aly carried their arms and their religion to the western extremity of Africa, and the whole country from the Mediterranean to the Indus was in a short time reduced to acknowledge the religion of Mahomed. The propagation of his religion was the first object and ambition of a Mahomedan conqueror: extension of dominion only the second. The same enthusiasm which carried Mahomedan arms and religion to the shores of the Atlantic and gave a religion to the Syrians, the Persians, and the Affghans, brought down the irresistible torrent on the plains of India. Mahomed of Ghuzni, the first Mahomedan king, who visited India was a zealous and a bigotted Mussulman. Without any intention to settle in the country, without any wish to make it a permanent conquest; he ravaged the country twelve different times with fire and sword, carrying away innumerable prisoners as slaves, dethroning monarchs and razing temples and cities to the ground. The same bigotry and fanaticism excited the ambition of Mahomed Shary, and Kotub-ood-din at last settled in India. From him to Baber, various dynasties succeeded each other till the Mogul dynasty rose to a dignity which it had never before attained, and continued to hold the reins of the empire till it was overthrown by the English in the nineteenth century. The bigotry and the severities of Aurungzebe are too generally known to require any elucidation. Suffice it to say that a portion of the Hindoos were compelled to adopt the religion of the conquerors. Various means were adopted to convert the children of the soil to the Mahomedan religion. When preferment and money failed, force was substituted, and in the reign of Alumgir, thousands of Hindoos were put to death for adhering to their own creed. The necessaries of life were monopolized by Government, and every expedient was used to convert the people. Liberty of conscience was denied to the subject, and the religion of the conquerors obliged them to deny it. The Mahomedan religion ever flourished when it was assisted by the

Mahomedan sword; without its help it seldom gained many proselytes. The Mussulmans were therefore forbidden to allow any other religion to exist in the world, but their own, and a Mahomedan could not disobey the injunctions of the prophet of God.

The consequence of this bigotry was that the Mahomedan Government was never popular in India, and that the Hindoo chiefs of Rajpootana always revolted, and were never totally subdued.

The British Government however never force conscience, and they have to the present day never interfered with the religious belief of the people. The mosque and the temple of the Mussulman and the Hindoo are under their administration as secure as a church, and the Hindoo can sound the shell, the Mahomedan call out five times every day to God, without giving any offence to the indifferent ears of the Government. Mankind respect and hold their religious opinions dearer than their lives. Rather than change their religion, they are willing to submit to any tortures and severities they may be made to undergo. The plains of Thanesur, and the temple of Somnath, are yet red with the blood of many a martyr, who sacrificed his life in the cause of his religion. The British Government is unquestionably very tolerant in this respect, and every town and every village from Peshour to Cape Comorin and from Bengal to the Indus resounds with unqualified admiration of their toleration. The Gospel and the Koran are in this respect diametrically opposite to each other. The Gospel inculcates never to unsheath the sword, the Koran teaches that as the first duty of a Mahomedan. Intolerance is never for an instant tolerated by the present rulers of this country. No sooner was the Punjab proclaimed to have been annexed to the British empire than liberty of conscience was simultaneously allowed to the people inhabiting that country.

Under the Mahomedan Government, the people never enjoyed any sort of political freedom. The emperor was the sole monarch of the country, his will the only law of the land. His smiles or his frown decided the fate of the wealthy and the poor, the weak and the strong. His word was not to be disputed. To give any unfavorable opinion of the laws was a capital crime. To speak of Government unfavorably was criminal.

Under the British Government no laws are passed until they are proclaimed to the public, and the people are at liberty to suggest any reasonable emendations. The Mahomedans ever treated the natives as a conquered people or rather the genius of their constitution allowed no freedom to the subject. The British Government in India is unquestionably despotic: the difference between the two Governments is only that the present wields the sceptre more mildly. The Mahomedan Emperor was a despot, and nothing but his own fears could control him.

The *British power* is absolute, the administration is calculated to allow a certain degree of freedom to the subjects. The liberty of opinion at present is great. This liberty no where developes itself so powerfully as in the opinions of the press. The liberty of the press is a blessing to the people; which, though a great majority of them have not the ability to enjoy, will sometime or other prove of the greatest advantage to them. Through the medium of the press they can bring their grievances to the notice of the Government, which the Government is generally ready to redress. Through the same channel, Government is acquainted with the opinions of the public with regard to any Act or Regulation. Sometimes the Government is attacked on all sides, and the result is generally a reformation in its conduct. It is the opinion of some people that the natives of India enjoy more liberty than is generally allowed to a conquered people. Certainly, the natives enjoy more freedom in some respects now than they enjoyed under the Mahomedan Governments. The Government has, however, much to give, and probably the people will receive much as they become more and more civilized.

The despotic form of government is ever the most pernicious to freedom of any kind. It is the interest of such a form of government to keep the people in a state of slavery. The least freedom is incompatible with its genius. The despot is always fearful of the people and the nobility, and none are more cruel than those who have most to fear. In a despotic country the lives and property of the people are always very unsafe, and personal liberty is little known or understood by the subject. Under the British Government, the persons of the people are free unless that liberty be forfeited by any crime against the state.

During the Mahomedan rule, the provinces remote from, and near the capital were governed by viceroys, accountable only to the king, and otherwise independent within their jurisdictions. It was their interest to make their fortunes as soon as they could, for they were removable at the pleasure of the emperor. Those governors or viceroys were required to pay a certain sum of money to the emperor every year, and as long as the emperor got the money, he cared not how the province was governed. The governors enjoyed absolute sway; and the possession of wealth or a handsome relation was generally equivalent to the commission of a crime. The wealthiest people were seized and placed in custody at the whim or pleasure of the governor. There was no appeal but to the emperor; but the capital was remote, and his person inaccessible.

British laws and administration have extended the blessings of personal liberty to the poorest people. Commercial liberty is now much greater than it ever was under the Mahomedan Government. Properly speaking, the people of India never carried on commerce

on any extensive scale until the British conquered this country. The Mahomedan Government never possessed a navy, and the Europeans only carried goods from India and appropriated the profits thereof to themselves. At present the natives carry on an extensive commerce, and Calcutta, Bombay and Madras have now become the richest cities in India.

Essay by Mohumed Ishaq of the 1st English Class in the Dehlie College, "On the General History of British India."

India has always been reported to be the richest and most civilized country in ancient times. Its resources are not yet exhausted. But whatever may have been the state of the country, its first history is however obscure. The aborigines still inhabit some of the hills and mountains. They were expelled by the present Hindoos, who are acknowledged not to be the original inhabitants of the country. Its correct history commences from the conquests of Alexander the Great. A colony of brahmins came from across the Himalaya and took possession of the country. They established castes and divided the whole of the inhabitants into four classes, the brahmins, the chutrees, &c. The first seat of government of the Hindoos was Oude, afterwards Ojein, when the kingdom split into two branches. These two kingdoms were at first very limited in extent, but gradually extended their bounds.

The city of Dehlie was anciently called Bhamte Versa from Bhamte, a king who established or founded it. The site of the ancient city of that name is not far distant from the present city of Dehlie. Notwithstanding the great magnificence, splendour, and glory of the empire of India under some of the most powerful Hindoo princes, India has never or for any long period of time been, according to most authentic accounts, independent.

It seems very true that the Shasters or Sanscrit language, which the brahmins brought with them, was most industriously cultivated under the Hindoo princes; for even in the days of the Pandoos, one of their number of the name of Vias collected the sages of that age in his court, and with their assistance composed the puranans. The code of laws which Menu collected, deserves our esteem very much, for it contains all the laws of the Hindoo system. Some of these laws are certainly very good. In the ancient history of the Hindoos, two incidents are very remarkable, the Ramayun and the Mahabharut. These were wars as the Hindoos say, fought between gods and giants, in which the former were successful. The hero of the first is Ram, and second Krishn and his brothers. After these wars, there prevailed some confusion in the country, on account of family contests and quarrels. Some few centuries

afterwards, a new invader came and conquered the great part of the country. This was Mohumed of Ghazni, who gained some victories repeatedly over the Hindoos, plundered their most renowned temples, and returned with great spoils to Ghazni. Dynasty after dynasty was temporarily settled on the throne of Dehlie and expelled. The Dooranees, the Khans, the Syuds, and Tooghluks came for a time forward on the stage and then disappeared.

At last came the Mougols, who subdued nearly the whole of the country and settled their dynasty on the throne of Dehlie, which reigned nearly for *eight hundred* years.

The country had been subject to the Persian arms even before the conquests of Alexander. The Mahomedans, though their government was comparatively powerful, never did hold the whole of India completely under their control. The governors paid tribute and obedience in proportion to their distance from the seat of government. The governors and provinces remained in their obedience. As long as a powerful monarch was on the throne, they paid their tribute in subjection, but the moment a weak monarch succeeded, they threw off their yoke and became independent. The highest state of glory to which the empire of India ever attained during the Mahomedan administration, was in the time of the emperor Akber, the son of Hoomayoon, but even then the symptoms of decay were apparent.

He was certainly a prince of a noble disposition, possessed of great talents and qualifications, and an intimate friend to toleration in which he was superior to all his predecessors. The religious enthusiasm of the Mussulmans ever kept them separate from the Hindoos. There was never any amity between them. The laws of the Mahomedans with regard to the Hindoos were not totally impartial. After Akber, the empire of Dehlie under his successors began gradually to decline, when in the time of Mahomed Shah it was totally ruined by the encroachments of Nadir, who plundered the treasury and country, massacred thousands of people, and caused the revolt of a number of provinces and the whole of the Deccan. The French had founded some settlements on the coast of Malabar, and intended to extend their bounds when in the reign of Aurungzebe, the British came into notice, and settled in Calcutta, having formerly obtained a firman from the emperor. Though Nizam-oolmulk and Sirajuddoulah were at first the chief obstacles to the settlement of the British, yet they were gradually removed.

The object of the British was at first only the trade of the country, yet when oppressed they were obliged to undertake its conquest. They then began to extend their limits and wrested from the French and Dutch all their settlements. The establishment of the British power in India may be dated from the battle of Plassey, in which Sirajuddoulah was overthrown.

They established themselves in the Deccan when Shah Alum invoked their aid to relieve him from the oppressions of the Muhrattas, who then plundered the country. The English put down not only these, but all other marauders, and restored peace in the country. They established their power at Dehlie in the year 1802. They introduced wholesome laws and allowed full toleration. Their government is popular, but that of the Mahomedans was not at all so. Justice is now administered impartially. The interests of the people are now much more regarded than they have ever been either under the Hindoo or the Mahomedan governments.

The manners of the Hindoos form an important part of the history of India. The present Hindoos are just the same with the Hindoos at the time of the conquests of Alexander, and even before him. Their food is the vegetables which the earth produces, and their drink water. Their dress is simple as is their diet. They still continue to burn their widows as was done formerly. They pay the same respect to brahmins, and are ignorant of their religious books, and therefore subject to the will of the crafty brahmins. There is no change in their manners. The English government, by spreading civilization, has wrought a slight change in their manners, but the savages still adhere to their ancient forms and practices.

But one thing is very certain, the Hindoos are much more happy under the British than they ever were under the Mahomedan governments. There is much difference in the policy of the British and that of the two other nations.

Questions in Literature proposed to the Senior Class, Benares College, and Answers by Ram Kali Chowdhree.

Question. Explain the passage—

"Come on, sir; here's the place:—stand still.
—How fearful
And dizzy 'tis to cast one's eyes so low!
The crows, and choughs, that wing the midway air,
Show scarce so gross as beetles: Half way down
Hangs one that gathers samphire; dreadful trade!
Methinks he seems no bigger than his head:
The fishermen, that walk upon the beach,
Appear like mice; and yon tall anchoring bark,
Diminish'd to her cock; her cock, a buoy
Almost too small for sight: The murmuring surge
That on the unnumber'd idle pebbles chafes,
Cannot be heard so high:—I'll look no more;
Lest my brain turn, and the deficient sight
Topple down headlong."

By whom, and to whom, and where, was this speech made. Explain the meanings of the words "samphire," "cock."

What motive is ascribed to Edgar for feigning himself mad?

Answer. Come on, sir; this is the place that you wanted. Stand still. Edgar now imposes on the blind man his father, by describing the plain that he brought him into, to be the summit of the cliff, that he was desired to lead him to, by saying how one is terrified and turned dizzy looking down on the beach below. The crows and choughs, that fly in the sky half-way above the sea, scarcely appear as large as beetles. The samphire-gatherer, that hangs half-way down seems to me no bigger than his head, how dreadful is his occupation! The fishermen that are walking upon the beach appear like mice. The large ship, that is going to anchor yonder, appears so much diminished in size as to be taken for her cock-boat: and the latter seems to be a bubble, almost too small to be perceived. The waves that roar on the beach abounding with pebbles, cannot be heard so high. I will look down no more, or else my head will turn dizzy, and the sight being deficient, I shall fall down headlong.

Edgar spoke it, while he was standing on a level field together with his blind old father, and falsely describing it to the latter to be the summit of the cliff that he wanted.

Samphire grows on the side of steep rocks that rise on the sea shore; and the low people, who have business with them, gather them by standing on rugged projected sides; or some other contrivances that they help to raise there. So Edgar says the occupation is dreadful, on account of its being carried on in a dangerous situation.

"Cock" means the cock-boat that is attached to a large vessel.

Edmund, the bastard son of the Earl of Gloster, with a design to inherit the possessions of his father, against the claims of his legitimate brother Edgar, contrived to make it known to Gloster, that his brother intended, in spite of his filial obligation, to take his life. The father was much incensed, and would scarcely be appeased, but with the blood of Edgar. He issued a proclamation against him. In order to escape, Edgar thought it advisable to counterfeit the character of a Bedlamite.

Q. Explain the following passage.

"Blow, wind, and crack your cheeks! rage! blow!
You cataracts, and hurricanoes, spout
Till you have drench'd our steeples, drown'd the cocks!
You sulphurous and thought-executing fires,
Vaunt couriers to oak-cleaving thunder-bolts,
Singe my white head!

And

"Spit, fire! spout, rain!
Nor rain, wind, thunder, fire, are my daughters:
I tax not you, you elements, with unkindness,
I never gave you kingdom, call'd you children,
You owe me no subscription."

By whom was the speech delivered, and when, and where.

Explain the expressions "sulphurous" and "thought-executing fires." What is meant by "vaunt couriers," and "you owe me no subscription?"

A. Blow you storm and break these cheeks! blow you raging wind! You cataracts by the co-operation of hurricanoes throw up your waters, till you have drowned our steeples and cocks, *(that are kept upon them to show the direction of the wind.)* You sulphurous and quick fires, that forerun oak-cleaving thunders, burn my white head! You sky, throw fire, pour on rain! You rain, wind, thunder, fire, you are not my daughters. I do not censure you elements with unkindness; you are not under obligation to obey me (then why do you treat me thus, like my daughters, whom I have censured as unkind and disobedient to me).

King Lear uttered this speech.

"Sulphurous and thought-executing fires" are here applied to those that precede thunder. They are called "sulphurous," because particles of sulphur are thought to be mixed with the clouds that give them out.

On account of their being as quick as doing any thing by thought, they are called "thought-executing fires." By "vaunt couriers" are meant the avant-couriers that precede any great man, to call out to the passengers to move out of the way.

"You owe me no subscription," means you are not under the obligation of paying me obedience.

Q. Give the plot of this play.

A. In former times there reigned a King, named Lear in Britain, who had three daughters, viz., Goneril, Regan and Cordelia, the first two being married to the Duke of Albany, and the Earl of Cornwall respectively. On being worn out with age and cares of government,

and intending to transfer his burden to younger shoulders, he called together his three daughters and nobles, and asked each of the former how much they loved him, in order that the division of the kingdom might take place according to their merits. The first and second displayed a great parade of rhetoric in declaring their warmest love to their father; and so they were rewarded each with an ample third of the kingdom. Cordelia the youngest, declared with plainness, that she loved him as is due from a child to a father, neither more nor less. This appeared to Lear to be rather a proof of ingratitude than a plain truth; so he gave her nothing but maledictions. At this time the King of France and the Duke of Burgundy were residing in the court of Lear, and seeking the hand of his youngest daughter. Burgundy being avaricious, declined to take the dowerless girl. Whereas, France, whose love for her was enkindled to warm respect in opposition to the cold neglect of others, took her to wife by the permission of the King. Lear then divided the remaining third division, or rather the whole kingdom and his coronet among his elder daughters, and their husbands. He sentenced the Earl of Kent to banishment, who interceded in behalf of Cordelia, and warned him of the sordid flatteries of Goneril and Regan, who only wheedled him out of his kingdom. Nevertheless, Lear bestowed all upon them on the condition that he should retain the nominal title of sovereignty, and should be supported by them by alternate months, retaining a retinue of a hundred Knights.

The prophecies of Kent were now to be realized: within a month his eldest daughter grew disaffected with him and his Knights; tasking her with ingratitude and unkindness, and burdening her with numerous curses, he removed himself with his attendants to Regan. Here he was received also with the same cold looks. Both daughters now desired him to disband his followers, and thus deprived him of his last authority.

Thus being ill-treated by his daughters, he went mad with grief, and was only attended by his fool and the banished Earl of Kent in disguise. Cordelia being informed of this, invaded the kingdom to reinstate her father on the throne. A battle took place in which the French army was defeated, and Cordelia and Lear who was then in her camp were taken prisoners. But the other two daughters of the King met the reward of perfidy and ingratitude by death. About the same time it happened that Edmund, the bastard son of a nobleman, the Earl of Gloster, by his tricks and underhand contrivances, deprived his father and brother of their possessions, and at last came to be the husband of those pelican daughters. But fate at last ordained these devilish children of the King and Gloster to meet their deaths among themselves, except Edmund, who received it from the hands of the noble Edgar, his legitimate brother. But the conclusion was really a tragic scene; Cordelia, the honest daughter of Lear was killed in the prison; and

the father followed her immediately to the grave out of intolerable grief.

Q. What led to the alienation of Cordelia from the affection of her father?

What was the cause of Lear's madness?

What was the end of Cordelia?

Where are Dover and Burgundy?

A. Lear was a man somewhat heady and unwise. On his requiring his daughters to deliver their feelings of love towards him, Cordelia, contrary to her sisters, expressed plainly that she loved him as a child is bound to do its parent. Lear was incensed at this, and reproached her with curses, and deprived her of her dower.

Goneril and Regan both disappointed him in his hopes of kind treatment from them. They desired him to dismiss his retinue, on pretence of their being riotous. Thus having found in his daughters the intention of depriving him of his last authority, and repenting of his unkindness towards his youngest daughter, he went mad.

Cordelia was killed in prison by the order of Goneril and Edmund.

Dover is situated in the south-east of Britain, and Burgundy in the north-west of France.

Questions in History proposed to the Senior Class, Benares College, and Answers by Gobind Chunder Sandel.

The Reign of Charles I.—Mackintosh's England.

Question. What title did Charles wish to assume on his accession, and what opinion did the Judges give on the subject being submitted to them?

Answer. Charles, soon after his accession to the throne, aspired to assume the title of King of Great Britain and Ireland. He referred the matter to the Judges of his Bench, they replied that consistently

with the Laws and Constitution of the realm he could not do it; they cited the example of his father James 1st, who having assumed that title was advised to lay it down.

Q. Upon what grounds was Buckingham impeached by Parliament? By whom was the impeachment conducted?

A. The charges brought against Buckingham were manifold and various. His maladministration as Lord High Admiral, the multiplicity of offices which he united in his person, his employing an English Squadron against the Protestant Rochellers of France under pretence of employing it against Genoa, and his intrigues with Gondemar, brought to light by the late disclosures of the Earl of Bristol were made the grounds of his impeachment.

Buckingham was impeached at the Bar of the House of Lords by Pym and Hollis, in the name of the Commons of England.

Q. What members of the House of Commons were imprisoned? on what pretence were they confined, and what was the effect upon the Commons?

A. Sir John Elliot, Strode, Long, Digges and Noy were imprisoned by the order of Charles. The pretence made by him was their having spoken in the house certain incendiary and disrespectful words, and their insolent carriage against him. This arbitrary measure produced a ferment in the Commons, they declared their imprisonment illegal and subversive of the Constitutional rights of Parliament, and proceeded to draw up a remonstrance to be presented to the King for redress of grievances.

Q. What dissensions took place between the King and Queen?

A. By the marriage treaty, Charles was bound to allow Henrietta the free toleration of her religion, and to erect a chapel for her use. The indifference which he displayed towards her religious prejudices was the cause of this dissension. She complained of the delay with which the erection of the building proceeded; the inconvenience of discharging her religious functions was tauntingly answered by the King, and was told that the court-yard of her palace was capacious enough for saying her prayers. The irregularities and disorders of the Queen's French attendants served to inflame his mind against them; the palace was soon purged of these pests much to the grief and lamentation of Henrietta. These domestic dissensions between Charles and his Queen were probably cherished and fomented by Buckingham, who feared to lose his ascendancy over the mind of his Royal Master through the influence of the Queen.

Q. What measures did the King take to obtain supplies?

A. Loans, benevolences, imposts by prerogative and the exactions of tonnage and poundage duties, were the arbitrary instruments with which Charles determined to obtain supplies after the dissolution of the Parliament in 1626.

Q. What led to the Petition of Rights and what was Charles's conduct with regard to it?

A. The levying of ship-money and the despotic exactions of the King, which rendered the name of Hampden immortal on the records of history, and handed him down to posterity in all the glowing colors of a patriot, were strenuously opposed by the patriotic leaders in the House of Commons and led to the memorable Petition of Rights in 1628. The conduct of Charles towards it was marked by the same bad faith which characterized all his proceedings. The tyrant never made a concession which he was not determined to revoke; plainness of dealing was a virtue unknown to him. Finding the torrent of opposition in Parliament too strong for him to resist, he gave a shuffling assent, but the Pyms and Elliots of the Commons were men of too determined a character to be thus deluded by his sinister arts. They did not cease to exert themselves in bringing the precarious rights of the subjects to a decisive point, and in defining the prerogatives of the crown by a broad line of demarcation, and at last succeeded in forcing Charles to give his assent to the Bill in the due and constitutional form of Parliament. Copies of the Petition of Rights were printed and issued out for the information of all subjects of the realm, not bearing the present gracious answer, but his former prevaricating assent. Such was the faithless conduct of Charles with regard to the Petition of Rights.

Q. Give a short account of the leading men in these times of both parties?

A. It is impossible for the mind not to be impressed with the great contrast of character which the party attached to the King and that of the Parliament present. On one side we view the instruments of despotism, and Charles encroaching on the liberties of the subject and furnishing every device that could be invented to enable the crown to trample down the constitution of the kingdom. On the other side were arrayed the stern and calm virtues of the Commons of England, which enabled them to bind the tyrant hand and foot, and to preserve the rights of the people safe and entire. Among the Councillors of the King was Holland, the creature of the late favorite the duke of Buckingham and the reputed lover of the Queen. Weak and irresolute, he aspired to supply the place of the minion, and cringed to all the arbitrary acts of Charles to secure his favor.

Digges and Noy, formerly members of the lower House and now renegades to the Royalists, who had rendered their names notorious by the invention of ship-money imposts. Coventry the Lord keeper, a man of questionable character, supported Charles in his tyranical views against the Parliament. Bishop Williams, distinguished for his opposition and intrigues against Buckingham, and Laud Archbishop of Canterbury, the great supporter of Armenianism, were also of the Royalist party. Essex, son of the more famous General who stormed and took Cadiz in 1596, John Hampden, a gentleman of fortune in Buckinghamshire, who staked his life and property in opposing the impost of ship-money, Coke, a man of extensive legal acquirements, Sir John Cotton, the learned antiquary, Sir John Elliot, Hollis, Haselrig, and Pym, already distinguished by their opposition to the crown, belonged to the Parliamentarians; Lucius Carey, the great Lord Falkland, and Sir Thomas Wentworth, afterwards the powerful but unfortunate Earl of Strafford, were at first on the side of the opposition.

Q. What was the cause of the commencement of troubles in Scotland?

A. The chief causes of the commencement of troubles in Scotland were, the introduction of the Liturgy, and the establishment of Episcopacy by the King.

Q. What was the Long Parliament; who were the chief leaders both in the Commons and the Lords?

A. The Parliament known in History as the Long Parliament of England commenced its Sessions in 1640, and never ceased to sit till it had overturned the Constitution and Government of the Kingdom, and introduced a vile oligarchy under Cromwell.

The Earls of Bedford, Essex, Arundel, Pembroke and Warwick, Lords Brooke, Kimbolton and Say, were the chief leaders in the House of Lords. Those of the Commons were Hampden, Pym, Hollis, Haselrig, Strode, St. John, the younger Vane, and Sir Thomas Wentworth, who afterwards joined the Royalist party.

Q. Give a brief account of Strafford. In what way did Charles behave towards him?

A. Sir Thomas Wentworth distinguished himself in the early career of his life as a leader of the popular party in the House of Commons; he was subsequently bought off by the King, created Earl of Strafford, and appointed Lord Lieutenant of Ireland, in which capacity, he introduced many salutary measures and greatly contributed to the improvement of the country. On his coming over to

England, he was impeached in the House of Lords by the Commons of England of high treason and misdemeanors; but finding it could not proceed, they dropped the impeachment and brought in a Bill of Attainder against the Earl, and sent it to the King for his signature. Charles was at first reluctant to comply with their requests, but after some hesitation affixed his seal. Thus did the King sacrifice one of the ablest and most devout of his servants, whom, if he had saved, it would have most probably given a new turn to the subsequent affairs which led Charles to the block.

The Earl of Strafford was executed in the 49th year of his age, 1641.

GENERAL REPORT

ON

PUBLIC INSTRUCTION

IN THE

NORTH WESTERN PROVINCES

OF THE

BENGAL PRESIDENCY,

For 1850-51.

AGRA:

PRINTED AT THE SECUNDRA ORPHAN PRESS.

1852.

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REPORT.

GENERAL REVIEW AND OBSERVATIONS.

Several changes have taken place in the Educational Institutions of these Provinces, during the year under report. These will be noticed under the head of the Institutions to which they refer.

Agra College.

The condition of the Agra College remains much as before. The progress made in the English classes is satisfactory, and the advantage of the instruction afforded to the pupils, continues to be shown by the readiness with which they obtain active employment. The number of paying students continues to increase. It is a gratifying sign of the activity of mind, excited in this College, that nearly all the advanced English students are in the habit of giving gratuitous instruction to others during their leisure hours.

The state of the Oriental classes is not altogether such as could be wished. The Arabic and Sanscrit Departments, in particular, appear to be in a declining state.

Dehlie College.

It was mentioned in last year's Report, that Mr. Cargill had succeeded Dr. Sprenger, as Principal of the Dehlie College.

The proceedings of the year present little cause for remark, except that, as at Agra, the Arabic and Sanscrit classes are falling off, while the greater attention bestowed on the study of English is evidenced by the increasing numbers of those who are willing to pay for instruction in that language.

Benares College.

The attention of the able Principal of the Benares College continues to be devoted chiefly to the Sanscrit Department, and especially to the class of Pundits, who, after attaining high proficiency in Sanscrit, are now engaged in the study of English, and in the acquisition of European learning. The Report contains ample extracts from Doctor Ballantyne's own account of his labors with these classes, and of the various works which he was preparing to publish, connected with the Sanscrit language and philosophy. Of these works, several have since been completed and printed; among which may particularly be mentioned

he interesting series of Aphorisms, laid down by the founders of the six philosophical systems.

The new College building promises to be every way worthy of the purpose for which it is designed; but its progress has been much slower than was anticipated, and the expense has also very much exceeded the original estimate. To a certain degree, this may be accounted for by the architectural pretensions of the building, and by the want of data for accurately calculating the cost of ornamental finishing, executed in a style to which the workmen were previously strangers. The total sum hitherto sanctioned by Government for this edifice is Rs. 98,196, in addition to which, Rs. 27,189 have been expended from private subscriptions. It is confidently expected that he College will be completed and opened before the close of the urrent year.

Roorkee College.

The Roorkee College has advanced rapidly in credit and usefulness under the direction of the Principal, Lieutenant Maclagan. It is much to be regretted, that the post is soon to be vacated by that officer, in consequence of his departure on furlough to England.

The demands on the College for the public service have far exceeded the number of qualified students, which, in its present state, it is able to supply. A scheme, for placing the whole Institution on a new and extended footing, is now before the Home Authorities. The correspondence, connected with this, does not fall within the year under report, but its substance has been included in a separate treatise lately printed, giving the history of the College and the plan for its enlargement.

Bareilly College.

It has long been in contemplation to raise the Bareilly School into a College, so as to put a superior order of education within the reach of the inhabitants of Rohilkund. This measure has now been carried into execution, after a careful enquiry into the state of the present Institution, particulars of which will be found in the Report. Mr. V. Tregear, to whose exertions, as Superintendent, the School owes its present flourishing condition, has been appointed Principal of the new College. Since the close of the year under report, the services of Mr. E. Blackwell, formerly employed in the Elphinstone Institution at Bombay, have been engaged for the College under notice.

Ajmere School.

In the Report under the head of the Ajmere School, will be found mention of the considerations which have led to the re-establishment of this Institution. It is hoped that from several causes, the people of that part of the country will now better appreciate the advantages of a liberal edu-

cation, than they did when those advantages were before offered them. The experiment, however, will not be fairly tried, till the Institution is placed on the footing of a College, and this cannot be done from the Education Fund at present at the disposal of Government.

Jubbulpore School.

The causes which have led to the abolition of the Jubbulpore School, will be found fully detailed in the correspondence entered under that head. The state of the Education Fund does not at present permit of the establishment of a College at Saugor, but the idea is not abandoned.

Proposal to bring the Colleges in Bengal and in the N. W. P. under a common system of study and examination.

The Government has been in communication with the Council of Education at Calcutta, on the subject of a proposal to assimilate the studies of the Colleges in Bengal and in the North Western Provinces, as far as regards the English classes, and to bring them all under one common examination. The advantages of the plan are obvious, as inducing regularity of system, and affording means for comparing the progress made in each College with that of all others in both divisions of the Presidency. The obstacles to the plan consist, first, in the circumstance that the examinations in Bengal are now held at a different period from those in the North Western Provinces, and secondly, in the inability of the native students in the North Western Provinces to purchase a succession of expensive books, such as are often prescribed for the Bengal course. The scheme of union is not yet altogether matured; but it is hoped that the above difficulties will be overcome, and that the plan will take effect, partially in 1852, and completely in the following year.

Supervision of Indigenous Village Schools, and establishment of Tehseeldaree Schools.

It was mentioned in the last Report that the sanction of the Home Government had been received to the introduction into eight Districts of the plan proposed by the Lieutenant Governor, for improving and extending the existing system of Village Education. This was to be attempted; 1st, by organizing an Establishment for examining and superintending the existing Schools, and for granting small rewards where most deserved; 2ndly, by establishing a Government School of the same nature as the Village Schools, but of a superior order, at the head quarters of each Tehseeldaree; and 3rdly, by composing and adapting books, better suited than any now available, for the use of all these places of education.

The management of this scheme has been committed to Mr. H. S. Reid, C. S., who has applied himself to its presentation, in its several branches, with much zeal and assiduity.

The results of that gentleman's proceedings, as far as they are at present apparent, will be seen from his Report, which is separately printed and circulated together with this volume.

Account of the Bhopal School, by the late Captain J. D. Cunningham.

In page 3 of the General Report on Public Instruction in the North Western Provinces for 1846-47, mention is made of a School at Bhopal in Central India, and in Appendix D. to that Report will be found a letter from Captain J. D. Cunningham, dated Schore, (Bhopal) October 31st, 1846, giving an account of the Institution. During the hot season of 1850, Captain Cunningham, who was then at Simlah for the benefit of his health, obligingly drew up a further account of this School, bringing its history down to that time. This document is interesting in itself, as furnishing complete information regarding an Institution, calculated to exercise much influence on the native mind in that part of the continent of India. It possesses a deeper interest from the subsequent melancholy decease of its intelligent and high-minded author. The paper in question, together with some supplementary remarks by the same able hand, on the general question of Education in India, will be found in the Appendix.

Annual Accounts.

The usual annual accounts, as furnished by the Accountant, North Western Provinces, will be found at the close of the Appendix.

Subjoined is a statement showing the numbers and castes of the students in the several Institutions, as they stood on the 30th April 1851.

General Statement of the Number, Caste, &c., of Students, on the 30th April 1851.

Names of Institutions.	Number on 30th April 1851.				Average attendance.	Remarks.
	Christians.	*Hindoos.*	*Mohomedans.*	Total.		
Agra College,	37	305	43	385	*	* Not stated in returns.
Dehlie College,	22	105	206	333	293	
Benares College,	2	259	18	279	228	
Roorkee College,	21	15	25	61	*	
Bareilly College,	7	205	60	272	*	
Ajmere School,	†	†	†	†	†	† No returns furnished.
Saugor School,	12	181	25	218	*	
Jubbulpoor School,	‡	‡	‡	‡	‡	‡ Abolished prior to 30th April 1851.

AGRA COLLEGE.

28TH YEAR.

Local Committee of Public Instruction at Agra, on the 30th April 1851.

NAMES.	DESIGNATION OF OFFICE.
J. S. Boldero, Esq., ...	Late Civil and Sessions Judge of Agra.
C. Grant, Esq., ...	Accountant, N. W. P.
J. Thornton, Esq., ...	Secretary to Government, N. W. P.
W. Muir, Esq., ...	Secretary to the Sudder Board of Revenue, N. W. P.
R. Thornton, Esq., ...	Assistant Secretary to Government, N. W. P.
M. R. Gubbins, Esq., ...	Magistrate and Collector of Agra.
P. B. Reid, Esq., ...	Deputy Collector and Deputy Magistrate of Agra.
S. S. Brown, Esq., ...	Civil and Sessions Judge of Agra.
F. B. Pearson, Esq., ...	Register Sudr. Dewy. and Nizt. Adawlut, N. W. P.
J. Murray, Esq., ...	Civil Surgeon, Agra.
H. S. Reid, Esq., ...	Visitor General of Schools in the N. W. P.
J. Middleton, Esq., ...	Secretary, Local Committee Public Instruction.

Establishment of the Agra College, as it existed on the 30th April 1851.

DATE OF APPOINTMENT.	NAMES.	DESIGNATION.	AMOUNT OF SALARY.
1st Feb., 1845, ..	J. Middleton, Esq.,	Principal, ...	600 0 0
25th April, 1844,	Mr. J. K. Williams,	Head Master, ...	400 0 0
25th April, 1846,	Mr. J. F. McConnell,	Second ditto, ...	200 0 0
31st March, 185[illegible],	Mr. J. W. Beale, ..	Third ditto, ...	130 0 0
8th April, 1851,	Mr. A. Sharpley, ..	Fourth ditto, ...	100 0 0
20th Feb. 1847,	Kedarnath, ...	Fifth ditto, ...	50 0 0
	Kulyan Singh, ...	Sixth ditto, ...	25 0 0

Establishment of the Agra College—(Continued).

Date of Appointment.	Names.	Designation.	Amount of Salary.
20th Jan. 1849,	Nejabut Ali, ...	Seventh Master, ...	16 0 0
	Moolchund, ...	Eighth ditto, ...	14 0 0
28th Dec., 1842,	Mr. J. F. McConnell,	Writing ditto, ...	30 0 0
9th Jan., 1846, ..	Mr. N. Parsick, ...	Teacher of Land Surveying, ...	200 0 0
3rd Nov., 1846,	Ishry Pershad, ...	Assistant Mathematical Professor,	100 0 0
7th April, 1851,	Moolvi Ali Akbur, ..	Arabic Professor, ...	100 0 0
21st Jan., 1847,	Abool Hussen, ...	1st Persian Teacher,	60 0 0
19th Aug., 1824,	Mohomed Raheem, ..	2nd ditto ditto, ...	30 0 0
5th Feb., 1850,	Kureemoodeen, ...	1st Oordu ditto, ..	50 0 0
	Ali Asghur, ...	2nd ditto ditto, ...	30 0 0
3rd Sept., 1850,	Gholam Dustgeer, ..	3rd ditto ditto, ...	14 0 0
19th Aug., 1824,	Kewul Ram, ...	1st Sanscrit ditto, ..	60 0 0
15th March, 1841,	Heera Lall, ...	2nd ditto ditto, ...	20 0 0
3rd Nov., 1848,	Munnoo Lall, ...	1st Hindee ditto, ...	50 0 0
8th August, 1848,	Kesho Pershad, ...	2nd ditto ditto, ...	30 0 0
8th Sept., 1826,	Choonnee Lall, ...	3rd ditto ditto, ...	20 0 0
15th Aug., 1825,	Shunker Lall, ...	Hindee Arithmetic do.	30 0 0
	Establishment.		
30th Jany., 1849,	Naseer Khan, ...	Librarian, ...	25 0 0
3rd May, 1841, ..	Chunnoo Lall, ...	English Writer, ...	16 0 0
		2 Duftrees @ 5 & 4 ea.	9 0 0
		1 Furrash, ...	5 0 0
		1 Bhishty, ...	7 0 0
		1 Chuprasy, ...	4 0 0
		2 Chowkeedars @ 4 ea.	8 0 0
		2 Brahmans @ 3-8 ea.	7 0 0
		1 Sweeper, ...	4 0 0
		Contingencies, ...	4 0 0
		Total Rs., ..	2448 0 0
29th Feby., 1848,	Mr. S. W. Fallon, ..	Supernumerary, ...	250 0 0
	Grand Total, Company's Rupees,		2698 0 0

Statement of the Number, Caste, &c. of the Students of the Agra College on the 30th April 1851.

Statement shewing the number of Students paying, and the amount paid by them; and Students who do not pay; as also the amount of Entrance Fees on the 30th April 1851.				*Statement shewing the number of Students studying each of the languages taught, on the 30th April 1851.*						*Statement shewing the number of Students on the 30th April 1851.*			
Non-paying.	Paying and amount realized during the year, deducting the expense of collecting.	Amount of Entrance Fees realized during the year.	Total.	English.	Arabic.	Persian.	Oordu.	Sanscrit.	Hindee.	Christians.	Mohomedans.	Hindoos.	Other than these three.
	12 at 5 Rs. each. 7 at 3 Rs. each. 25 at 1 Rs. each. 202 at 8 As. each.				A	B	C	D	E	37	43	305	0
139	246			371	13	116	173	25	81	Total,		.. 385	
	Rs. As. P. 2133 0 0 96 0 0	Rs. As. P.	Rs. As. P.										
	2037 0 0	224 0 0	2261 0 0										

A—Of these 2 read Persian, 1 reads Oordu and 8 English.
B—Ditto 1 ditto Arabic, 2 ditto ditto and 107 ditto.
C—Ditto 1 ditto ditto 2 ditto Sanscrit, 2 Persian and 168 English.
D—Ditto 1 ditto Hindee and 23 English.
E—Ditto 1 ditto Sanscrit and 76 English.

Statement of the Receipts and Disbursements of the Agra College, during the official year 1850-51.

Resources of Annual Income.

Separate Fund.		*Assignment from Parliamentary Grant.*	* Total.	*Assignment from additional Grant.*	*Establishment fixed by Government.*	†*Tuition Fees.*	*Grand Total of Receipts.*
Endowment of Village Collections from the Estate of the late Gungadhur Pundit, under orders of Government, dated 7th November 1823, viz:							
Jhoondavye, zillah Agra, ...	4355 8 0						
Choomoha, pergunnah Muttra,....	5849 6 11						
Villages in zillah Allyghur, ...	5694 15 9						
Interest on Rs. 1,78,400, as per General Committee's Report for 1842-43.	7466 10 8						
	23366 9 4	0 0 0	23366 9 4	14733 5 4	34300 0 0	2261 0 0	40360 14 8
					Total Co.'s Rs...		40360 14 8

Actual Charges during the Year.

Nature of Charges.	*Items.*	Total.
Principal, ...	7200 0 0	
English Teachers, ...	13609 14 6	
Vernacular ditto, ...	5793 11 1	
Establishment, ...	1020 0 0	
English Scholarships, ..	1376 7 5	
Oriental ditto, ...	1304 0 1	
Prize allowance, English Department...	150 0 0	
Ditto Oriental ditto, ...	150 0 0	
Medal Allowance, ...	0 0 0	
Contingencies, ...	143 6 9	
Postage, ...	80 7 0	
		30737 14 10
Supernumerary Masters,	5750 0 0	
		5750 0 0
Total Co.'s Rs., ..		36487 14 10

Exclusive of the following Items:		
Balance of last Year, ...	298 13 9	
Prize Allowance for both Departments, ...	300 0 0	
Fines realized, ...	128 15 9	
Books sold, ...	727 10 6	
Medal Allowance from Government, ...	0 0 0	
Postage from ditto, ...	86 12 0	
Discount on Remittances to England, ...	10 8 0	
Robertson and Mansel Prize Funds, ...	200 0 0	
Admission Fees, ...	224 0 0	
Tuition ditto, ...	2037 0 0	
	4013 12 0	
Expended for Books, Stationery, Apparatus, Furniture, Medals, &c., &c.. ..	3341 0 2	
Balance 1st May 1851, Rupees, ...	672 11 10	

† Monthly Fees, ...	2133 0 0
Admission ditto,.....	224 0 0
	2357 0 0
Deduct expense of Collection,.....	96 0 0
Total Co.'s Rs....	2261 0 0

List of Scholarships of the Agra College as they existed on the 30th April 1851.

Name.	Designation.	Amount of Scholarship.	Remarks.
	English Department.	R. A. P.	
A. Sharpley, ...	Senior Scholar, ...	25 0 0	Resigned.
Sookhdeo Buksh, ..	Ditto, ...	25 0 0	
Ameer Khan, ...	Ditto, ...	25 0 0	Resigned.
Koonj Behary, ...	Ditto, ...	16 0 0	H. H. the Rajah of Bhurtpore's Scholarship.
R. Forrest, ...	Junior Scholar, ...	8 0 0	
Shiv Churn, ...	Ditto, ...	8 0 0	
Abhai Churn, ...	Ditto, ...	8 0 0	
Balmokund, ...	Ditto, .. .	8 0 0	
Choonnee Lall, ..	Ditto, .. .	8 0 0	
Chundun, ...	Ditto, ...	6 0 0	
Khoomani Singh, ..	Ditto, ...	6 0 0	
J. Blanchett, ...	Ditto, ...	4 0 0	
Jadonath, ...	Ditto, ...	4 0 0	
Jwala Pershad, ..	Ditto, ...	4 0 0	
Doorga Pershad, ..	Ditto, ...	4 0 0	
Bhugwan Chund, ..	Ditto, ...	4 0 0	
Ameer Khan, ...	Anglo-Vernacular, ..	16 0 0	Resigned.
	Oriental Department.		
Niaz Ali, ...	Arabic Scholar, ...	16 0 0	
Ruttun Lall, ...	Ditto, ...	6 0 0	
Hosein Ali, ...	Ditto, ...	4 0 0	
Roohoolla, ...	Senior Persian, ...	16 0 0	
Ameer Khan, ...	Ditto, ...	16 0 0	Resigned.
Sheonarain, ...	Ditto, ...	6 0 0	
Sookhan Lall, ...	Junior Persian, ...	4 0 0	
Shiv Rakhun, ...	Sanscrit, ...	16 0 0	
Kalee Churn, ...	Ditto, ...	12 0 0	
Gokul Chund, ...	Ditto, ...	6 0 0	
Pohpee Ram, ...	Ditto, ...	4 0 0	
Bhugwan Chund, ..	Ditto, ...	4 0 0	
	Total, ..	289 0 0	

AGRA COLLEGE NOTICE.

The examination of the students of the Agra College commenced in the middle of November 1850, and lasted to the 20th of December of the same year.

According to the Report of the Principal, the demand for admission into the College was particularly active during the past year, a greater number than could be properly accommodated having presented themselves. The consequence was, that several eligible candidates had to be refused, or their admission postponed. 393 students were on the Rolls of the College on the 1st December 1850, whilst the average number throughout the session was 407, of whom 41 were Christians, 40 Mohomedans, and 325 Hindoos.

The number of students who left the College for employment during the past year was 18; of these one was employed at Mirzapore as a teacher of the Missionary School there, 6 were employed as Visitors in Zillah Schools, and one student, Kunhya Lall by name, who distinguished himself in an eminent degree at the preceding examination, proceeded in June 1850 to Roorkee, where he has since been giving much satisfaction.

The following is a detailed list of the 18 students who obtained employment in various capacities in 1850.

List of Students of the Agra College who obtained employment during the year 1850.

No.	Names.	Class.	Nature of Employment.	Amount Monthly Salary.		
1	Mohun Loll, ..	1st,	Pergunnah Visitor, ...	20	0	0
2	Kunhya Loll, ..	"	Roorkee College, ...	70	0	0
3	Rooghan Pershad,	"	Office of Inspr. Genl. of Village Schools,	20	0	0
4	M. Harris, ..	"	Commissioner's Office, Umballa, ...	70	0	0
5	Kalee Churn, ..	"	Missionary School, Mirzapore, ...	30	0	0
6	Hurdial Singh, ..	2nd,	Post Office, Meerut, ...	20	0	0
7	Koondun Loll, ..	3rd,	Pergunnah Visitor, ...	20	0	0
8	Choonnee Loll, ..	"	Commissariat Office, ...	16	0	0
9	Bhopaul, ...	4th,	Private employ, ...	8	0	0
10	Elahee Buksh, ..	"	Apprentice, Commissioner's Office, ..	0	0	0
11	Heera Lall, ..	5th,	Pergunnah Visitor, ...	20	0	0
12	Shama Churn, ..	"	Civil Auditor's Office, ...	20	0	0
			Oriental Department.			
1	Ramdial, ...	1st Sanscrit	Pergunnah Visitor, ...	20	0	0
2	Thakoordass, ..	"	Ditto Ditto, ...	20	0	0
3	Nisar Ali, ...	Arabic,	Ditto Ditto, ...	20	0	0
4	Bunarsi Khan, ..	"	Naib Peshkar, Zillah Agra, ...	30	0	0
5	Augha Ali, ...	1st Persian,	Agra Collector's Office, ...	10	0	0
6	Ameer Buksh, ..	"	Ditto Ditto, ...	10	0	0

It was gratifying to learn that so large a number as 37 students had come from places very remote from Agra to study in the College, because it leads to a very fair presumption, that the natives entertain a high estimate of the system of education pursued in this Institution, and are willing to make great personal sacrifices to avail themselves of its advantages. Enquiries were made by the Principal with a view to ascertain how far the students assisted in extending the knowledge they acquired to others with whom they came in contact during their leisure hours, and it was found that, with one exception, all the youths of the two senior classes gave gratuitous instruction, and that the number so instructed was 158, of whom 97 were not of the College, while 61 belonged to it.

From the following statement it will appear that the number of paying students had increased from 185 (the number at the close of 1849) to 233 (the number at the close of 1850) and that the income derivable from that source had similarly increased from 140 Rupees to 203 Rupees monthly.

Comparative Statement of the paying Students of the Agra College at the close of the years 1849 *and* 1850.

	1849. Paying.				Total Monthly.	1850. Paying.				Total Monthly.
	5 RS.	3 RS.	1 RE.	8 AS.	R. A. P.	5 RS.	3 RS.	1 RE.	8 AS.	R. A. P.
Christians, ...	3	1	4	20	32 0 0	10	6	7	12	81 0 0
Hindoos, ...	4	2	13	118	98 0 0	2	2	17	160	113 0 0
Mohomedans, ...	0	0	0	20	10 0 0	0	0	1	16	9 0 0
Total, ...	7	3	17	158	140 0 0	12	8	25	188	203 0 0

The arrival from England during 1850 of the apparatus detailed in the following list enabled the Principal to complete the course of Lectures sketched in the College Syllabus.

List of Apparatus purchased for the Agra College during the year 1850.

No. of each.	*Description of Apparatus.*
1	A Ross's Compound Microscope complete with subsidiary instruments.
1	Apparatus for production of the Lime Light.
1	A Table Polariscope.
1	A set of Crystals for experiments on Polarised Light.
1	A spare Cylinder for the Electric Machine.
	Newton's Rings.
1	Model of the Reflecting Telescope.
2	Optical Models, long and short sight.
1	Model of the Microscope.
1	Dissecting Pyramid.
1	Wheatstone's Photometer.
1	A hand Tourmaline Polariscope.
1	Magic Lantern with condensing lenses.
9	Astronomical slides with rack work for the Magic Lantern.
24	Ditto plain for ditto.
1	Portrait of the Queen for ditto.
2	Prisms on brass stands with ball and socket joints.
1	A model of the boiler and steam Engine.
1	Stand for seconds Pendulum.
1	Graduated Jars for the Voltameter.

The following were the results of the examination of the different classes in order commencing with the lowest.*

ENGLISH DEPARTMENT.

9th English Class.

This class consisted of 76 students under the instruction of Pundit Kedar Nath. It reflected great credit upon its teacher. The Reading, Spelling and Arithmetic of the Senior Division were all good. The lower division likewise acquitted itself creditably, the only defect observed, being a mispronunciation of the letter W.

8th English Class.

This class was under the charge of Pundit Moolchund, and, like the class below and the two next above, consisted of two divisions, the total number being 71. Half the day was devoted to Oriental and half to Occidental studies. The Reading and Explanation of the senior division were found to be very defective, and it was observed that while many of the

* When not otherwise mentioned, the examination was conducted and reported on by the Principal.

youths gave the meaning of whole sentences, they failed to attach the right meaning to the *individual* words of which they were composed. The quantity of matter read was found to be very considerable, but the pupils seemed to have lost sight of the higher object of reading *well* in their ambition to read *much*. The lower division was in a great measure free from these faults, but the remark was made by the examiner that "unless the Master was more careful, or rather unless his efforts were directed with better judgment, the class would fall off." The unfavorable opinion passed on the Reading and Explanation, was not applicable to the Writing, which was carefully taught, and the principles of Arithmetic were evidently well explained.

7th English Class.

This class consisted of 52 pupils under the instruction of teacher, Moonshee Nijabut Alee. The class was much improved in pronunciation since last year. The explanation of the senior division was somewhat defective, but the defect was probably due to the difficulty of the particular passage in which the youths were examined. The junior division acquitted itself creditably in all respects, and won for Moonshee Nijabut Alee, the character of a painstaking and assiduous teacher.

6th English Class.

This class consisted of 64 students under the tuition of Pundit Kulyan Singh. The class did not acquit itself as well as it had usually done. The pure consonant S was found to be unpronounceable by the whole class without the aid of an initial vowel. The explanations given of passages read to them were not very exact. The habit of training the youths first to convey the meaning of the author accurately, and then idiomatically, seemed to be disregarded by the tutor. The Spelling and Grammar were likewise found defective, but their Writing and Arithmetic reflected great credit on the teacher.

5th English Class.

This class consisted of 30 students under the instruction of Mr. John Beale. The Reading and Explanation were generally good, and few very backward youths were found in the class: the questions in Grammar were not so well answered as might have been expected, but the Geography and Writing were creditable.

4th English Class.

This class consisted of 29 youths under the charge of Mr. George Wiggins, that gentleman conducting all their studies except Geometry, which was attended to by the Assistant Professor. The Reading was found to be very fair throughout the class; but the explanation was not so good. The Writing and Geography were both creditable, the Arithmetical questions were accurately and neatly answered, but the examiner observed that little progress had been made since last year. Their Geometry was limited to the 1st Book of Euclid, but it is due

to the youths to state that they had comprehended the definitions and mastered all the propositions which had been gone over.

3rd English Class.

This class consisted of 28 students. The Literature Proper was in the hands of Mr. McConnell, the 2nd Master. Mr. P. B. Reid, who examined it in this branch of study, said "that the Reading and Grammar were pretty "fair on the whole, but he was sorry he could not say as much for the "Explanation. The piece selected was not a difficult one, yet the "generality of the boys did not seem to comprehend many of the ideas "in it." The Geometry was creditable to the Assistant Professor, Ishry Pershad, so far as the matter of the answers went, but the manner in which those answers were written was found very slovenly, the commencement and conclusion of a proposition being rarely marked, and the connecting words and symbols which sustain the links of the demonstration being invariably omitted. The examiner observed that the "teacher did not seem sufficiently to bear in mind that, as an ele-"ment of a Collegiate course, the study of Euclid was more generally "beneficial as a mode of intellectual training than as the groundwork "of any high scientific attainments."

The Historical attainments of the class were far from creditable, but their progress in the Introductory Treatise on Mechanics, published by the Society for the Diffusion of Useful Knowledge, was satisfactory. It was, however, remarked that "their notices of elementary "truths proved sometimes incorrect: for instance 'essential' was under-"stood to signify 'general.' The etymological meaning of the term "was not understood, and hence its technical force was not perceived; "an 'atom' was indeed defined according to the book, but it was said "to be porous, elastic, and the like." The opinion of the Committee generally of this class was not a favorable one.

2nd English Class.

This class consisted of 26 students, and as far as the Literature Proper was concerned, was instructed by the Head Master. Mr. S. S. Brown, who examined the class in this branch of study, expressed "his satisfaction at "the manner in which the youths acquitted themselves, considering "the difficulty of the passage selected for examination." He remarked "that though "in several instances the youths expressed them-"selves inaccurately, they nevertheless showed themselves very gene-"rally masters of the subject."

In respect to Mathematics, the examiner stated, "The Geome-"try and Algebra taught by the Assistant Professor shows marked "improvement since the previous examination; when so defective "and meagre were their attainments that the Committee found it "necessary to order, that youths not fit to pass a creditable examination "in Plane Geometry and in Algebra to Simple Equations, should not

"be deemed qualified in future for promotion to the higher class. "This order seems to have done the good anticipated from it."

In Natural Philosophy the pupils had been reading the Introduction to Mechanics, by the Society for the Diffusion of Useful Knowledge, but the examiner complained of the same inexactness in the answers, which has been observed of the class below. The students of this class attended the Principal's Lectures on Experimental Philosophy in common with the class above, and many of them showed considerable acquaintance with the subjects illustrated, a circumstance attributable to the assiduity of the Assistant Professor, who made it a practice to interrogate the youths after the lecture, and explain wherever necessary. In their Historical studies, the pupils had made creditable progress, a circumstance due to the exertions of Mr. McConnell. Their knowledge of Geography was found to be scanty, and the examiner did not seem pleased with the proficiency of any portion of the class in this respect. The Committee therefore assigned one of the Mansel Prizes for the present year to renewed excellence in this branch of study, in the hope that the stimulus thus afforded might assist in bringing about some improvement. In all other respects, the state of the class was deemed to be satisfactory.

First or Senior English Class.

The senior English class consisted at the examination of 11 students, having fallen to that number from 17 during the early part of the Session. The senior student had left in June 1850 to join the Roorkee College, and the remaining secessions had been chiefly from the middle of the class.

Literature.—The Literature Proper was in the hands of the Head Master, Mr. Williams. The *vivâ voce* examination was held and the written answers examined by Mr. R. Thornton, who remarked, "the "answers of A. Sharpley are very superior to those of any other member "of the class, and are very creditable to himself. Sookhdeo Buksh, "Hurghian Singh and Ameer Khan have acquitted themselves well, "though the latter entered upon the examination at some disad-"vantage, owing to his late absence from the College. Among the "students of the second division, E. Hutton ranks first, though Jug-"gut Narain has answered many questions well, and Koonj Behary "has made good progress in the short time which has elapsed since "he commenced the study of English. The *vivâ voce* examination "gave nearly the same results with the written papers. The accent "and pronunciation of the boys generally was good, and the more "advanced members of the class spoke with fluency and explained "with ease."

Essay.—The efforts of the youths in respect to the Essay did not seem to have been very successful. Mr. J. Thornton, who gave

the subject, and examined the best Essays, remarked, "There can be "no question that Sharpley's is the best of these Essays; but I "hardly think that even his is worthy of the gold medal. It is not "badly expressed, and the matter, as far as it goes, is sufficiently appo-"site, but it does not show much originality or range of thought; "considering the poorness of the competition, as well as the positive "merits of the best Essay, I think it will be sufficient to reward the "writer with a handsome book, or some inferior prize of that kind."

Mathematics and Physics.—Lieutenant Maclagan set a paper on Experimental Physics, and examined the answers as well as those to the Mathematical questions. He observed, "Sookhdeo Buksh has "been very successful in the Mathematical paper, and some of the "answers appear to me remarkably good. If he is still supposed to "be a candidate for Roorkee, I should imagine him up to the mark "in the subjects prescribed by Government, and well prepared to pass "the usual examination. I have been disappointed, however, in his "answers to the questions on Natural and Experimental Philosophy. "Some of the failures no doubt arise from his inability to express "clearly what he knows, but I think he should have made something "better of questions Nos. 2, 18, 21.

"Sharpley's answers are very good, on the subjects of the Lec-"tures especially, to which he seems to have paid much and intelli-"gent attention. His answers to Nos. 18 and 21, I would particu-"larly notice; also Ameer Khan's answer to No. 18. I believe he "continues to keep Roorkee in view, and I should augur well of him "from the present performance."

Law.—The answers to the questions on Blackstone's Commentaries were examined by Mr. Pearson, who reported on them as follows.

"I have bracketed A. Sharpley and Ameer Khan as equal. "They have obtained the same number of marks, and though I have "looked over their papers a second time, I do not think that a second "valuation would produce any material difference. This result tells "much in favor of Ameer Khan, as his seventy-three marks were "acquired by twelve answers only, while his competitor, who has the "advantage of writing in his native tongue, found time to answer "fourteen questions."

"The answers given by these two youths, and also by Sookhdeo "Buksh, are creditable to the intelligence and diligence with which "they have studied the text-book.

"I am not satisfied with the answers given by Dabidas and "Jugut Narain.

"The papers of the others are not satisfactory. E. Hutton's age "requires allowance to be made for him. The same excuse is far less "applicable to Kunhya Lall, and I am almost surprised to find him "and Benee Ram in the same class with Ameer Khan and Sookhdeo "Buksh."

The Committee observed that the circumstance of Kunhya Lall and Benee Ram acquitting themselves so indifferently, was in a great measure to be ascribed to the fact of their having then been very lately admitted into the senior class, and the studies pursued in it being entirely new to them.

Political Economy.—Some of the best answers to his questions on this subject had been submitted to Mr. Pearson, who considered them creditable.

Anglo-Vernacular.—The translations from and into the Vernacular were examined by Mr. W. Muir, who also selected the subjects; he reported:

"The papers of the first English class only have come before me. They consist of (1) a passage from DeLolme's Constitution of England to be translated into Urdoo; (2) a passage from the Ukhlaq 'Jelali (Urdoo) to be put into English; (3) Grammatical questions 'on the same; (4) the same passage to be rendered into Urdoo, the 'terms and construction being varied as much as possible.

"Ameer Khan's papers are most creditable to his progress, and "it is satisfactory to find in this one instance marked excellence in "the Occidental studies, accompanied by a perfect acquaintance with "his own language, and ability to express himself with propriety "therein.

"The writing is perhaps on the whole improved, but attention "to this branch must not be relaxed. It is mortifying to find in the 'writing of the lad second on the list, Azim Buksh, such an error 'as منحسر for منحصر; in that of the 5th, Dabidas, such mistakes as 'قايدہ for قاعدہ and بازوں for بعضوں; and in that of the 6th مضيم for 'مظيم and مضدور for مزدور. Such errors will gradually cease if the sys-'tem of writing exercises from dictation, be steadily pursued from 'the youngest class upwards, pains being taken by the native 'Masters to point out every instance of improper Spelling."

History.—The answers to the Historical papers were examined by Mr. H. S. Reid, who reported on them as follows:

"The knowledge of English History displayed by the majority "of the students who stood the examination, is very creditable. I "am sorry that I cannot report equally favorably on their answers "in Roman and Mahomedan History, as set forth by Gibbon. The "questions proposed for answer were perhaps too comprehensive; to "answer them in the given time required that intimate knowledge "which alone can enable the pupil to condense his matter. The "answers given were in some instances good, but many questions were "left untouched by those students who were most successful in what "they had attempted. The senior department papers were taken up by "but one scholar. I am compelled to make the same remark regard-"ing the Orthography of the Students, as is recorded by Mr. C. C. "Jackson in his review of the Historical answers given in the Annual "Examination of 1847. I would beg to recommend for adoption the "judicious suggestions therein thrown out. Azim Buksh, Dabi Dass, "and Bani Dass show great ignorance of the idiom and structure of the "English language. A. Sharpley and E. Hutton enjoy the advan-"tage of writing in their own tongue. Of the native students, as "far as I can judge from the papers before me, Ameer Khan ranks "first in ability, and Sookhdeo Buksh in industry and accuracy. "Jagat Narayan's knowledge of English idiom is very creditable. "Hurghian Singh also deserves commendation. A. Sharpley un-"doubtedly stands first; but his superior advantage, in his natural "knowledge of English, places him in that position. Considering the "circumstances of the case, the four students whom I have above-"mentioned deserve equal praise.

"The result of the examination, it appears to me, shows the "following. The industry and general Historical attainments of the "students are creditable, but not so their Orthography and Composition. "A. Sharpley's 'spelling' is very faulty, though his style of com-"position is good. On the whole, the students have acquitted them-"selves creditably."

The Surveying class had been engaged as usual in Measuring, Levelling and Protracting. Sookhdeo Buksh's Protractions were the best, and A. Sharpley's next in merit.

ORIENTAL DEPARTMENT, SANSCRIT BRANCH.

Oriental Department.

3rd Hindee Class.—This class consisted of 24 students under the instruction of Pundit Choonnee Lall. The class acquitted itself tolerably well, on the whole; but one fault was observed; viz., defective Spelling, which should be guarded against in future.

2nd Hindee Class.—This class consisted of 22 students under Pundit Kesho Pershad; it was examined by the Senior Hindee Teacher, Pundit Munnoo Lall, who reported favourably as to its general proficiency, but remarked that more attention should be paid to Grammar, as several defects were observed in this respect.

1st Hindee Class.—This class was examined by Pundit Kewul Ram. It consisted of 36 students, under Pundit Munnoo Lall. The examiner reported favourably on the general proficiency of the Class. The Grammar was particularly commended by him, indeed Grammar appeared to have been a favourite study with the class, and writing from dictation was made a regular exercise.

The Hindee Arithmetic class was taught by Pundit Shunker Lall. It consisted of 50 students, who all acquitted themselves creditably at the examination.

2nd Sanscrit Class.—This class consisted of 13 pupils under Pundit Heera Lall. It was examined by the head Sanscrit Pundit, who reported that the youths acquitted themselves well in all respects.

1st Sanscrit Class.—The advanced students of this class left the College during the season for employment, with the exception of Koonj Behary, whose attainments in Sanscrit were particularly commended by Dr. Ballantyne in his report of the examination of 1849, and even he, finding his English studies required devotion of his whole time, withdrew from competition.

Dr. Ballantyne selected questions for the four senior students, who remained, viz. the former 2nd Division, and examined the answers. It is gratifying to find that his report was favorable to the accuracy of the youths' performances, so far as their reading extended.

The Principal observed that considering the smallness of both the Sanscrit classes, and the circumstance that the large portion of time devoted to English by these very students precluded the possibility of either of the two classes being at any time numerously attended, it would be better to unite the two, and maintain the Junior Pundit as a supernumerary on the establishment. But it did not appear to Government that any advantage would arise from uniting them, so long as both the Pundits continued in office; at the same time, it was observed that if a vacancy occurred in either of those appointments, the subject should be separately referred for consideration.

ARABIC BRANCH.

3rd Urdoo Class.—This class consisted of 80 students under Moonshee Gholam Dustgeer. Having recently joined it, he could not be

accountable for its merits or defects. The meanings of individual words were given with creditable accuracy, but the best of the youths failed to apprehend the import of sentences which had not been made the subject of special study.

2nd Urdoo Class.—This class consisted of 53 students under Moonshee Ali Asghur; its merits were tested by Mr. Muir, whose opinion of it will be found in the remarks made by him on the attainments of the 1st Urdoo Class.

1st Urdoo Class.—This class consisted of 43 students under teacher Moonshee Kureem Oodeen; it was examined by Mr. Muir, who reported as follows:

"I was called upon this year to examine both the Urdoo and Per-"sian classes, and as the examination of each is in itself a heavy task, "the consequence is that I have been able to do the work but imperfect-"ly. Besides going over the written exercises of the higher classes, "I examined a considerable number of boys taken at random from the "various ranks, and, so far as this is a test of progress, the following "are the results I arrived at.

"The lower Urdoo classes did not please me much in their *vivâ voce* "translation. I fear that sufficient pains is not taken to explain the "meaning and force of each word separately. Groups of words are "run together, and the meaning of the whole is learnt by rote, while "that of the component words is unknown. Thus, several of the boys "when they came to *bînace ka nuqsan* translated readily enough "'blindness,' but they could not say what *bînaî* alone meant, because "they said the Moonshee did not tell them. As this occurred "repeatedly, it would seem to point to a real deficiency in the mode of "tuition pursued by the subordinate Urdoo Masters.

"The *vivâ voce* examinations of the higher Urdoo Classes were "upon the whole satisfactory."

Junior Persian Class.—The teacher of this class was Moonshee Mohumed Raheem; it consisted of 56 students, and was examined by Mr. S. W. Fallon, assisted by Moulvi Sudeed-ood-deen, who reported as follows:

"The class has read little, and that little imperfectly. The "difficult character of such works as Madho Ram and Abul Fuzl "might be some excuse, if the quantity got up were not so small. "Abul Fuzl, especially, is so much more Arabic than Persian, and the "style is so elaborate and involved to the last degree, that no student "can be qualified to read this work until he has mastered thoroughly "and completely, all the preparatory ones in use in the lower sections;

" whereas, it appears from the return that only an eighth part of each " book is read, and that so imperfectly as to obtain for the majority of " the students comprising it, marks considerably less than one half " of the full number. These remarks are illustrated by the fact, that " in the different passages selected for examination, nearly every line " comprised in itself at least six words, in every one of which many " of the students failed, and several failed in nearly all of them. Last " year, this class was a better one. The most successful competitor " is a lad belonging to the 1st Urdoo class, and not belonging to " this one at all, though competing with it."

Senior Persian Class.—The teacher of this class was Moonshee Abul Hussun, the number of students 73. Mr. Muir, who examined the youths reported as follows:

" I was pleased with the *vivâ voce* examination of the more " advanced youths, and, with reference to my remarks of last year, " I observed that more attention was paid to translate into idiomatic " Urdoo. I cannot say that I saw much improvement in the lower " grades."

" The written exercises were as follow: 1st, to translate a passage " of Zahoori into Urdoo; 2nd, Grammatical questions on the same; " 3rd, to these a voluntary exercise was added, viz. to translate into " Persian the passage from DeLolme above noted; but as this required " a good knowledge of English, it will be observed that only a few of " the students attempted the task.

" I have great pleasure in noticing Roohoola's proficiency. His " Persian Composition is very creditable to his instructors, and to his " own exertions. Ameer Khan, and Juggut Narain also deserve " honourable notice. I cannot say much for the rest; and I was much " disappointed by the discreditable papers of the lower half of the list. " The Orthography was generally good; but still some errors occur- " red which ought never to be the case in the head Persian class. " Thus for الان one youth (Jay Narain) writes العان and another " (Nath Dial) حلان."

Arabic Class.—This class had dwindled down to 10 students, and even they seemed to bring little spirit to bear on their work. Mr. Muir, who examined the youths *vivâ-voce*, remarked:

"I regret to observe that the Arabic class continues low. The "more advanced students, who are few, read and construed well, but "from the number and qualifications of the lower classes, there is little "prospect of this class attaining soon to that importance which the "interest and benefits of the study of Arabic would lead one to expect "from it."

On the 24th June, 1850, in compliance with the Principal's request, the Lieutenant Governor was pleased to appoint Mr. M. R. Gubbins, the Magistrate and Collector, and Mr. F. B. Pearson, the Register of the Sudder Adawlat at Agra, to be Members of the Local Committee of Public Instruction. Mr. S. S. Brown, Civil and Sessions Judge, was on a later date appointed a Member of this Committee.

The report furnished by the Principal of the result of the examination held in the middle of 1850, for the Robertson and Mansel prizes was satisfactory. The subjects were the same as those of the year preceding, and the examination was conducted by Messrs. Muir, R. Thornton, and H. S. Reid, who respectively proposed questions in Translation, History, and Law.

The Prizemen were:

Mr. A. Sharpley in History.
Ditto ditto in Law.
Ameer Khan in Translation.

Nothing very remarkable appeared in the Historical or Oriental attainments of the class; but marked improvement had been made in the study of the 1st volume of Blackstone's Commentaries.

Moulvee Sudeed-ood-deen, the Arabic Professor, having left the College to join the Calcutta Mudrussa, Moulvee Ali Akber was appointed in his room.

A scheme of studies proposed to be followed in the College in both Departments during 1851, will be found in the Appendix.

DEHLIE COLLEGE.

59TH YEAR.

Return of the Local Committee of Public Instruction, as on 30th April, 1851.

NAMES.	DESIGNATION OF OFFICE.
Sir T. T. Metcalfe Baronet, ...	Commissioner of the Dehlie Division.
J. P. Gubbins, Esq., ...	Judge.
A. Ross, Esq., ...	Civil Surgeon.
Nawab Hamed Ali Khan, ...	
Moulawi Sudder-ood-deen, ...	Principal Sudder Ameen.
Rai Ramsurn Doss, ...	Deputy Collector.
J. Cargill, Esq., ...	Secretary.

Establishment of the several Departments of the Dehlie College, as on the 30th April, 1851.

NAMES.	DESIGNATION.	SALARY.			DATE OF APPOINTMENT.
J. Cargill, Esq., ..	Principal, ...	600	0	0	1st July, 1850.
F. Taylor, Esq., ..	Head Master, ...	500	0	0	16th August, 1829.
Mr. E. Roberts, ..	2nd ditto, ...	200	0	0	19th September, 1846.
Mr. R. Steward, ..	3rd ditto, ...	150	0	0	12th October, 1843.
Mr. J. F. Goulding,	4th and Drawing Master,	150	0	0	4th July, 1848.
Wuzzeer Ali, ...	5th Master, ...	50	0	0	12th April, 1844.
Hoosainee, ...	6th ditto, ...	40	0	0	1st May, 1841.
Ram Kishen, ...	1st Urdoo Teacher, ...	80	0	0	1st January, 1834.
Sheopershad, ...	2nd ditto, ...	40	0	0	1st June, 1833.
Noor Mohomed, ..	3rd ditto, ...	30	0	0	17th May, 1841.
Taruck Nath, ...	Writing Master, ...	30	0	0	10th June, 1838.
Radha Kishen, ...	Nagree Teacher, ...	8	0	0	1st July, 1841.
Shunker Doss, ...	Librarian, ...	25	0	0	5th April, 1848.
Jeevun Ram, ...	English Writer, ...	13	0	0	5th April, 1848.
Noor Ali, ...	Duftry, ...	7	0	0	19th May, 1841.
	3 Chuprasies @ 4 Rs. each,	12	0	0	
	1 Durwan, ...	4	0	0	
	1 Furrash, ...	4	0	0	
	1 Chowkeedar, ...	4	0	0	
	1 Sweeper, ...	3	0	0	
	Contingencies, ...	20	0	0	22nd January, 1842.
	Prize Books, ...	20	13	4	4th January, 1843.
	Total, ...	1990	13	4	

ORIENTAL DEPARTMENT.

Names.	Designation.	Salary.	Date of Appointment.
Mumlook Ali, ...	1st Arabic Teacher, .	100 0 0	1st June, 1825.
Jafir Ali, ...	1st Shea ditto, ...	100 0 0	1st April, 1841.
Syed Mohomed, ..	2nd ditto Arabic, ...	60 0 0	1st June, 1825.
Soobhan Buksh, ..	3rd ditto, ...	30 0 0	1th December, 1831.
Immam Buksh, .	1st Persian Teacher, .	50 0 0	1st April 1811.
Hussun Ali Khan, .	2nd ditto ditto, .. .	35 0 0	1st December, 1830.
Kurreem Buksh, .	3rd ditto ditto, ...	25 0 0	2nd October, 1850.
Ram Chundra, .	1st Teacher of European Science, ...	100 0 0	28th February, 1841.
Ajoodhea Pershad, .	2nd ditto, ...	50 0 0	28th February, 1841.
Ram Chunder, ...	1st Sanscrit Teacher, ..	60 0 0	26th April, 1844.
Kidar Nath, ...	2nd Teacher, ...	20 0 0	1st April, 1844.
Syed Mohomed, ..	Writing and Nagree ditto,	28 0 0	5th July, 1829.
Radha Kishen, ...	Arithmetician, .. .	20 0 0	21st January, 1851.
Jeewun Ram, ...	English Writer, .. .	12 0 0	5th April, 1818.
Radha Kishen, ...	Treasurer, ...	10 0 0	16th April, 1829.
Ashruf Ali, ...	Moonshee, ...	10 0 0	15th September, 1831.
Ditto, ...	Librarian, ...	10 0 0	1st January, 1833.
	4 Chuprasees @ 4 Rs. each,	16 0 0	
	1 Furrash, ...	4 0 0	
	1 Chowkeedar, ...	4 0 0	
	2 Bhistees @ 4 each, ..	8 0 0	
	1 Kahar, ...	4 0 0	
	1 Gardener, ...	4 0 0	
	2 Sweepers @ 3 each, ..	6 0 0	
	Contingencies, ...	16 0 0	22nd January, 1842.
	Prize Books, ...	20 13 4	4th January, 1843.
	Total Co.'s Rs., .	2793 10 8	.

Statement of the Number, Caste, &c., of the Students, as on the 30th April, 1851.

Statement shewing the number of paying Students and the amount paid by them, and Students who do not pay on the 30th April, 1851.					*Statement shewing the number of Students studying each of the languages on the 30th April,* 1851.				*Statement shewing the number of Students on the 30th April,* 1851.		
Non-paying.	Paying.	Total.			English.	Arabic.	Persian.	Sanscrit.	Christians.	Mahomedans.	Hindoos.
		Rs.	As.	P.							
	15 at 5 Rs. each. 2 at 3-12 Rs. each. 3 at 3 Rs. each. 11 at 1 Re. each 2 at 12 As. each. 148 at 8 As. each										
152	151 Total,	1358	12	0	222	39	54	18	22	206	105
	Deduct,	48	0	0							
		1310	12	0					333		

204 of the pupils in the English Department, and 18 of the Sanscrit Department study Urdoo; 2 English pupils study Persian; 2 of the Persian Department study English; 67 of the pupils in the English College, and 46 of those in the Persian Department of the Madrissa study Nagree.

The daily average attendance of the students from the 1st May 1850 to 30th April 1851 is 203 in the English, and 90 in the Oriental Department.

Statement of the Receipts and Disbursements of the Dehlie College, from 1st May 1850 to 30th April 1851.

Resources of Annual Income.								
Separate Fund.		*Assignment from Parliamentary grant.*	Total.	*Assignment from additional grant dated 16th Dec., 1840.*	*Establishment and expenses as fixed by Government in their letter, dated the 16th Dec., 1840.*	*Additional Grant for Prize Books, dated 4th January 1843.*	*Grand total of Receipts.*
Escheat Fund,	3000 0 0						
Endowments from Nawab Itmad-ood-dowlah, ...	7253 5 4						
Total, ...	10253 5 4	8658 10 8	18912 0 0	21168 0 0	40080 0 0	500 0 0	40580 0 0

Actual Charges for 1850-51.		
Nature of Charges.	*Item.*	Charges.
English Department.		
Principal,	5186 10 8	
English Masters,	11074 15 8	
Drawing Master,	1800 0 0	
Vernacular Masters,	1800 0 0	
Writing Master,	360 0 0	
Nagiee Master,	96 0 0	
Librarian,	300 0 0	
Establishment,	564 0 0	
English Scholars,	3645 0 0	
Contingencies,	240 0 0	
Prize Books,	250 0 0	
		25316 10 4
Oriental Department.		
Arabic, Persian & Sanscrit Teachers,	6271 5 0	
Teachers of European Science,	1839 2 0	
Establishment.	1056 0 0	
Oriental Scholars,	3959 0 0	
Contingencies,	192 0 0	
Prize Books,	250 0 0	
		13567 7 0
Total Co.'s Rs., ...		38884 1 4

Receipts.	
Balance of last year,	607 5 2½
Fines realized,	331 8 0
Books sold,	1 34 12 9
Tuition fees,	1358 12 0
Income of the College Garden,	163 0 0
Prize allowance for both Departments,	500 0 0
Contingencies,	432 0 0
Total, Company's Rupees,	4427 5 11½

Expended.	
Prizes,	40 2 0
Books purchased,	2634 2 3
Contingencies,	612 9 9½
Charges for realizing Tuition fees,	48 0 0
Monitor,	110 12 9
Balance on the 1st May 1851,	981 11 2
Total, Company's Rupees,	4427 5 11½

List of Scholars as it existed on the 30th April, 1851.

Names.	Senior and Junior Scholars.	Salary.	Date of Appointment.
	English Department.		
Muckhun Lall, ..	Senior Scholar, ...	22 0 0	1st January, 1851.
R. H. Roberts, ..	Ditto ditto, ...	14 0 0	Ditto ditto.
E. Foy, ...	Ditto ditto, ...	14 0 0	Ditto ditto.
Juddoo Nath, ...	Ditto ditto, ...	13 0 0	Ditto ditto.
Bhugwan Dass, ..	Ditto ditto, ...	11 0 0	Ditto ditto.
Ameer Ali, . ..	Ditto ditto, ...	11 0 0	Ditto ditto.
Dwarka Nath, ...	Ditto ditto, ...	10 0 0	Ditto ditto.
Bisshun Nath, ..	Ditto ditto, ...	10 0 0	Ditto ditto.
Raja Lall, ...	Ditto ditto, ...	9 0 0	Ditto ditto.
Rujun Lall, ...	Ditto ditto, ...	9 0 0	Ditto ditto.
Gunga Pershad, ..	Ditto ditto, ...	9 0 0	Ditto ditto.
Tikun Lall, .. .	Ditto ditto, ...	9 0 0	Ditto ditto.
Nund Kishun, ...	Junior Scholar, ...	8 0 0	Ditto ditto.
Doorga Pershad, ..	Ditto ditto, ...	8 0 0	Ditto ditto.
Jawahur Lall, ...	Ditto ditto, ...	7 0 0	Ditto ditto.
Sut Cowri, ...	Ditto ditto, ...	6 0 0	Ditto ditto.
Ramjus, ...	Ditto ditto, ...	6 0 0	Ditto ditto.
Peearee Mohun, ..	Ditto ditto, ...	5 0 0	Ditto ditto.
Buldeo Singh, ...	Ditto ditto, ...	5 0 0	Ditto ditto.
Rujjoo Mull, ...	Ditto ditto, ...	5 0 0	Ditto ditto.
Sheo Narain, ...	Ditto ditto, ...	5 0 0	Ditto ditto.
Nahur Singh, ...	Ditto ditto, ...	5 0 0	Ditto ditto.
Elahee Buksh, ...	Ditto ditto, ...	5 0 0	Ditto ditto.
Kishun Lall, ...	Ditto ditto, ...	5 0 0	Ditto ditto.
Buddree Nath, ...	Ditto ditto, ...	4 0 0	Ditto ditto.
Banarsee, ...	Ditto ditto, ...	4 0 0	Ditto ditto.
Ladi, ...	Ditto ditto, ...	4 0 0	Ditto ditto.
T. Munrod, . ..	Ditto ditto, ...	4 0 0	Ditto ditto.
Goorsahae, ...	Ditto ditto, ...	4 0 0	Ditto ditto.
	Carried over, ..	231 0 0	

List of Scholars—(Continued).

Names.	Senior and Junior Scholars.	Salary.	Date of Appointment.
	Brought forward, ..	231 0 0	
Noor Mohomed, ..	Junior Scholar, ...	4 0 0	1st January, 1851.
Sheo Pershad, ...	Ditto ditto, ...	4 0 0	Ditto ditto.
Sroop Narain, .. .	Ditto ditto, ...	4 0 0	Ditto ditto.
Sree Nath, .. .	Ditto ditto, ...	4 0 0	Ditto ditto.
Ram Surroop, ...	Ditto ditto, ...	4 0 0	Ditto ditto.
Pran Kishun, ...	Ditto ditto, ...	4 0 0	Ditto ditto.
Ghos Mohomed, .	Ditto ditto, ...	4 0 0	Ditto ditto.
Byj Nath, ...	Ditto ditto, ...	4 0 0	Ditto ditto.
Sidgopaul, .. .	Ditto ditto, ...	4 0 0	Ditto ditto.
Shitab Roy, .. .	Ditto ditto, ...	4 0 0	Ditto ditto.
Nanuck, ...	Ditto ditto, ...	4 0 0	Ditto ditto.
Abdoolla, ...	Ditto ditto, ...	4 0 0	Ditto ditto,
Tara Chund, .. .	Ditto ditto, ...	4 0 0	Ditto ditto.
Sher Singh, .. .	Ditto ditto, ...	4 0 0	Ditto ditto.
Ramchunder 1st, .	Ditto ditto, ...	4 0 0	Ditto ditto.
Mohomed Hoosain, .	Ditto ditto, ...	4 0 0	Ditto ditto.
Kunhia, ...	Ditto ditto, ...	4 0 0	Ditto ditto.
Fakeer Chund, ...	Ditto ditto, ...	4 0 0	Ditto ditto.
Bishumbher, ...	Ditto ditto, ...	4 0 0	Ditto ditto.
Gopaul, ...	Ditto ditto, ...	4 0 0	Ditto ditto.
Amur Nath, .. .	Ditto ditto, ...	4 0 0	Ditto ditto.
Ramchunder 2nd, .	Ditto ditto, ...	4 0 0	Ditto ditto.
Monohur, ...	Ditto ditto, ...	4 0 0	Ditto ditto.
Nuwul Singh, ...	Ditto ditto, ...	4 0 0	Ditto ditto.
Chundoo Lall, .. .	Ditto ditto, ...	4 0 0	Ditto ditto.
Hoosinee, ...	Ditto ditto, ...	4 0 0	Ditto ditto.
Venaick, ...	Ditto ditto, ...	4 0 0	Ditto ditto.
Shunker Dass, ...	Ditto ditto, ...	4 0 0	Ditto ditto.
	Carried over, ..	343 0 0	

List of Scholars—(Continued).

Names.	Senior and Junior Scholars.	Salary.	Date of Appointment.
	Brought forward, ...	343 0 0	
	Arabic Department.		
Khaja Zeeaooddeen,	Senior Scholar, ...	15 0 0	1st January, 1851.
Ali Ahmud, ..	Ditto ditto, ...	12 0 0	Ditto ditto.
Nuzeer Ahmud, ..	Ditto ditto, ...	12 0 0	Ditto ditto.
Tafazool Hoosain, ..	Ditto ditto, ...	12 0 0	Ditto ditto.
Zeeaooddeen, ...	Ditto ditto, ...	10 0 0	Ditto ditto.
Mohomed Hoosain, ..	Ditto ditto, ...	9 0 0	
Seerajooddeen, ...	Ditto ditto, ...	9 0 0	
Moheeooddeen, ..	Ditto ditto, ...	9 0 0	
Rahim Buksh, ...	Ditto ditto, ...	9 0 0	
Abdoolla, ...	Ditto ditto, ...	9 0 0	
Mohomed Ameen, ..	Ditto ditto, ...	9 0 0	
Hoosain Buksh, ..	Ditto ditto, ...	9 0 0	
Alinuqee, ...	Ditto ditto, ...	9 0 0	
Mohomed Yakoob, ..	Ditto ditto, ...	9 0 0	
Gholamqoodsee, ..	Junior Scholar, ...	8 0 0	
Oolfut Hoosain, ..	Ditto ditto, ...	7 0 0	
Noorul Hussun, ..	Ditto ditto, ...	6 0 0	
Alumdar Hoosain, ..	Ditto ditto, ...	6 0 0	
Mohomed Mirza, ..	Ditto ditto, ...	6 0 0	
Luteef Hoosain, ..	Ditto ditto, ...	6 0 0	
Mohomed Mooneer, .	Ditto ditto, ...	5 0 0	
Fuzl Ruhman, ...	Ditto ditto, ...	5 0 0	
Khaja Buksh, ...	Ditto ditto, ...	4 0 0	
Aijaz Hoosain, ...	Ditto ditto, ...	4 0 0	
Imdad Ali, .	Ditto ditto, ...	4 0 0	
Sadicq Ali, ...	Ditto ditto, ...	4 0 0	
	Persian Department.		
Zukkaoolla, ...	Senior Scholar, ...	12 0 0	
Dhurmidhur, ...	Ditto ditto, ...	9 0 0	
Bubbar Ali, ...	Ditto ditto, ...	9 0 0	
	Carried over, ..	580 0 0	

List of Scholars.—(Continued).

Names.	Senior and Junior Scholars.	Salary.	Date of Appointment.
	Brought forward, ..	580 0 0	
Dilsher Khan,.. ..	Senior Scholar,..	9 0 0	
Agha Ali,.. . ..	Ditto ditto, ...	9 0 0	
Mohomed Beg, ..	Junior Scholar, ...	7 0 0	
Sulleemoolla, ...	Ditto ditto, ...	4 0 0	
Abdoor Ruzzak, ..	Ditto ditto, ...	4 0 0	
Ali Hoosain, ...	Ditto ditto, ...	4 0 0	
Ali Buksh, ...	Ditto ditto, ...	4 0 0	
Jankee, ...	Ditto ditto, ...	4 0 0	
Amurnath, ...	Ditto ditto, ...	4 0 0	
Abdool Ghunnee, ..	Ditto ditto, ...	4 0 0	
Ahmud Hoosain, ..	Ditto ditto, ...	4 0 0	
	Sanscrit Department.		
Gunga Bullub,.. ..	Senior Scholar, ...	12 0 0	
Pursram, ...	Junior Scholar, ...	5 0 0	
Gouree Shunker, ..	Ditto ditto, ...	5 0 0	
Ramsookh, ...	Ditto ditto, ...	4 0 0	
Munohur,..	Ditto ditto, ...	4 0 0	
Hurna, ...	Ditto ditto, ...	4 0 0	
Bishashur Nath, ..	Ditto ditto, ...	4 0 0	
Ram Jeevun, ...	Ditto ditto, ...	4 0 0	
Salugram,..	Ditto ditto, ...	4 0 0	
Rugho Nath, ...	Ditto ditto, ...	4 0 0	
	Total Co.'s Rs. ..	687 0 0	

The services of Doctor Sprenger were placed at the disposal of the Government of Bengal in May 1850, and the present Principal joined his appointment on the 2nd September following, the duties of Principal having previously been carried on by Mr. F. F. Taylor, and d s-charged to the satisfaction of His Honor the Lieutenant Governor, and the Members of the Local Committee of Public Instruction. The only other change of importance that took place in the Establishment was the leave of absence for one year granted to Moulvee Ahmud Ali, and the appointment of Moulvee Ali Akbar, to officiate in his room.

The College opened on the 21st January 1850, and closed again after the distribution of Scholarships on the 30th December 1850.

The average daily attendance in each Department was as follows:

In the English Department,	206	In the Persian Department,	40
„ „ Arabic ditto,	35	„ „ Sanscrit ditto,	13
			294

The following details will show the number of paying and non-paying students as they existed in December 1850, compared with that of December 1849, and also the number of students who on the former date were paying fees varying in amount from Rs. 5 to 8 annas. Among these were 13 Christian youths.

Department.	Free.	Paying.	Total.
English Department.			
December 1849, ...	153	81	234
Ditto 1850, ...	118	98	216
Arabic Department.			
December 1849, ...	41	4	45
Ditto 1850, ...	36	6	42
Persian Department.			
December 1849, ...	31	11	43
Ditto 1850, ...	22	16	38
Sanscrit Department.			
December 1849, ...	13	4	17
Ditto 1850, ...	12	3	15

Paying Students.

6	paying	Rs.	5	0	per mensem,	----	----	30	0	0
1	„	„	3	12	„	----	----	3	12	0
2	„	„	3	0	„	----	----	6	0	0
9	„	„	1	0	„	----	----	9	0	0
105	„	„	0	8	„	----	----	52	8	0
						Total Co.'s Rs.		101	4	0

The amount of tuition fees realized during 1850, was Rs. 1,131-12, the sum due on that account was Rs. 183-8, making a total of Co.'s Rs. 1,315-4, which shows an increase of Rs. 311-4 beyond the sum realized during 1849.

The following comparative statement of the number of pupils in each Department for the last nine years, in the month of December of each year, will serve to illustrate the present position of the College, and furnish a basis on which to ground an opinion as to the numbers in each Department that may be expected hereafter to avail themselves of the opportunities afforded by the College for obtaining a liberal education:

Department.	1842	1843	1844	1845	1846	1847	1848	1849	1850
English, ...	170	131	162	245	196	215	218	234	216
Arabic, ...	57	38	58	75	66	65	60	45	42
Persian, ...	57	58	53	109	89	47	40	42	38
Sanscrit, ...	39	43	32	31	24	28	15	17	15
Total, ...	323	269	305	460	375	355	333	339	311

It will be seen by this comparative statement, that the English Department has remained for the last four years almost stationary, while the Arabic and Sanscrit Departments present a remarkable falling-off. Some reasons were attempted to be given for the retrogression of the Sanscrit Department, and three, out of five, suggestions offered by the Pundits for its restoration were recommended by the Principal to the favourable consideration o. the Local Committee, and of the Lieutenant Governor, viz.:

1. That as the study of Geometry and Urdoo in the Sanscrit Department, hindered the progress of the student, the 2nd and 3rd classes should not study those subjects.

2. That out-door candidates for Sanscrit scholarships not being able to learn Geography, Urdoo, Arithmetic, &c. &c. in the city, should be considered eligible to scholarships without the study of those subjects.

3. That as those pupils who learn Sanscrit are generally very poor, the pay system should be discontinued in the Sanscrit Department.

The Committee thought "it would be unadvisable to make any exceptions in favor of the Sanscrit class," and "that the rules should be conformed to by all," and the Lieutenant Governor observed in reply to this portion of the Principal's Report, that he was inclined to think such changes inexpedient; that as the falling-off in numbers was observable in the Persian and Arabic, as well as in the Sanscrit Department, the same arguments would apply to all; that if the studies of these classes were confined to the learned books in these languages; nothing more would be done by the College, than might be done as well, or better, without its aid; that the object in view of liberalizing the minds of these future Pundits and Moulvees by bringing them under the influence of European Science had been often explained, and its importance acknowledged; that with regard to the small monthly fee now demanded for tuition, such demand was more than counterbalanced by the prospect held out to the students of obtaining scholarships, while the fee would be fully repaid by greater rapidity of progress than could be attained under private teachers; and that the apparent diminution in the popularity of the Oriental classes in the College, might perhaps be attributed to some want of method in the system of teaching, rather than to the demand of eight annas a month from the pupils.

The following list gives, as far as could be ascertained by the Principal, the names of the pupils of the Dehlie College who obtained employment during 1850, and the nature of such employment.

Motee Lall.—Translator to the Office of the Board of Administration at Lahore.

Dya Shunkur.—English Writer in the Office of the Magistrate at Pilleebheet.

Radha Kishen.—English Writer in the Office of the Superintendent of Roads.

Bhugwan Dass.—Ditto ditto in the Dehlie Post Office.

Muckhun Lall.—English Writer in the Dehlie Post Office.

Shcopershaud.—Ditto ditto.

Beharee Lall.—Persian Writer attached to the 11th Irregular Cavalry.

Ramjee Doss.—Persian Writer in the Office of the Magistrate of Dehlie.

Mohomed Hashun.—Ditto ditto in the Office of the Judge of Dehlie.

The annual examination extended from the 20th November to the 21st December, 1850. For the first English class, papers of questions were furnished by Government in Shakespear, Gibbon, Elphinstone's India, Mathematics and Natural Philosophy.

Some of the questions in Gibbon and Mathematics and Natural Philosophy, which appeared to the Local Committee to be foreign

to the course studied at the College, were omitted with the sanction of Government. The questions in the remaining subjects were prepared on the spot, and the written answers examined by the Principal and Head Master. The *vivâ voce* examinations were conducted by the same gentlemen with the assistance of teachers Ajoodhia Pershad, Ramkishen and Vuzeer Ali.

In the Arabic Department, papers in "Touzeeh" "Hidayah," and "Dewan-i-Motunubbi" were furnished by Government. Those on the other subjects, including the Persian questions, were prepared on the spot, with this exception, that the questions in Mathematics and Natural Philosophy which had been issued to the first English class were translated into Urdoo, and given to the senior Oriental Mathematical class. The answers in Arabic and Persian Literature, &c. were all examined by Moulvee Mumlook Ali and Syed Mohomed, and afterwards forwarded to the Mooftee Sudder-ood-deen Khan for his opinion. Those in Science were examined by the 2nd teacher of Science, Ajoodhia Pershad, assisted by the Arithmetician, Kurreem Buksh, while the 1st teacher of Science, Ramchund, lent his aid in examining the Historical answers.

For the Sanscrit pupils, papers of questions in "Kaumudi" "Mitakshura," "Rustrungunee," "Ootr Ram, Churitr," "Amurcosh" and "Munoo Sanhita," were furnished by Government. The answers to these, as well as to the papers prepared on the spot, were examined by Pundit Ghasee Ram, assisted by the College Pundits, to whom also were entrusted the oral examinations in Hindee.

The result of the examination, on the whole, may be pronounced exceedingly creditable both to teachers and pupils, with the exception of the third English class under the charge of Mr. Steward, which can scarcely be considered to have passed a good examination. Both the Principal and the Local Committee have exhorted Mr. Steward to be more careful for the future.

Sir Theophilus Metcalfe having placed at the disposal of the Committee a silver medal for the best Essay on the British Period of the History of India, Mr. Gubbins, who examined the Essays sent in, pronounced that of Muckhun Lall, of the 1st English class, to be the best, at the same time, bestowing considerable praise on that of Mohomed Ishaq, of the same class. The medal was accordingly conferred on Muckhun Lall at the public distribution of prizes in December 1850.

The medal offered by Mooftee Sudder-ood-deen Khan, for the best Urdoo Essay on the following subject, "Truth being always one, what are the causes which prevent men from going all in the right way, and why are the opinions of men so various?" was awarded to Mohomed Hoossein, a pupil of the 2nd Arabic class, the Mooftee himself having examined the Essays of the competitors.

The following abstract shows the number of pupils in the English and Oriental Departments, who devoted themselves, during 1850, to the study of the same or similar subjects.

	English.	*Oriental.*
Hutton's Mechanics, -- -- -- -- --	6	16
Differential Calculus, -- -- -- -- ----	6	7
Waud's Algebraic Geometry, -- -- -- --	6	7
Trigonometry, -- -- -- -- -- ----	25	7
Geometry, -- -- -- -- -- -- -- --	65	38
Algebra, -- -- -- -- -- -- -- ----	37	21
Brinkley's Astronomy, -- -- -- -- --	7	0
History of the Mogul Dynasty, -- -- ----	0	14
Natural Philosophy, -- -- -- -- --	37	20
Brief Survey of History, Part I., -- ----	28	6
Goldsmith's History of England, -- -- --	24	19
History of India, -- -- -- -- ----	13	0
Tytler's Universal History, -- -- -- --	13	0
Clift's Geography, -- - -- -- ----	32	11
Arithmetic, -- -- -- -- -- -- --	128	34
Aboolfida's History, -- -- -- -- ----	0	10

With reference to the preceding, the Secretary to the Local Committee observed, "Taking the comparative numbers of the two "Departments into consideration, it would certainly appear that "the best medium of conveying a knowledge of pure and mixed "Mathematics to the students of the College, would be the Urdoo, "could it be once satisfactorily ascertained that the knowledge "acquired in this manner was equal in amount and proficiency to "that acquired by means of the English. I am at present by no "means inclined to think that such is the case:" in connection with which the Lieutenant Governor observed that "the mere "comparison of the number of pupils who studied the same scientific "subjects in English and Urdoo respectively, would lead to little "result unless their comparative proficiency was also estimated; "that the periodical examinations ought to afford a sufficient test of "the attainments of both Departments, and that it was highly desira-"ble that correct information should always be kept up of the state "of the College in this respect."

It was highly gratifying to find that Ram Chunder, the senior teacher of European Science, assisted by Radha Kishen, the then senior scholar of the College, had, during 1850, completed a translation of Waud's Analytical Geometry into Urdoo, and furthermore had begun a translation of Young's Mechanics, and that the 2nd teacher of Science, Ajoodhia Pershad, had likewise effected a translation of Webster's Hydrostatics.

The Surveying class had been attended, during 1850, by 18 pupils of the English and 15 of the Oriental Departments; the Drawing class by 52 of the English, and 4 of the Oriental. Some of these drawings were forwarded to Government, and the Lieutenant Governor deemed them highly creditable, particularly those of Venaik and Suroopnarain.

Notices of the examination of out-door candidates were forwarded by the Local Committee, to the Commissioners of Dehlie, Meerut and Bareilly, with a request that they would make them known as widely as possible. On the day appointed, four Arabic and two Persian candidates presented themselves for examination, and of these one in the Arabic and two in the Persian were found qualified. So also in respect to the junior Sanscrit scholarships, 16 candidates presented themselves, and of these four were found qualified. With reference to this, the Lieutenant Governor observed that "the number of out-door candidates for scholarships had much fallen off as compared with last year* in the Persian and Arabic Departments; while in the Sanscrit Department, the number of candidates, as well as those found qualified, had increased." The Lieutenant Governor therefore saw less reason to relax the rule at present in force regarding the Sanscrit Department, as proposed by the Pundits of the College.

The prizes were distributed on the 23rd January, 1851, by Mr. J. P. Gubbins, Member of the Local Committee; they consisted of 85 books and 7 medals, besides those presented by Sir Theophilus Metcalfe and Mooftee Sudder-ood-deen Khan.

In May, 1850, the Secretary Local Committee forwarded to Government, copy of a letter addressed to him by the Resident of Indore, requesting that Moulvee Ahmud Ali, the 3rd Persian teacher of the College, who had been at Indore on leave of absence on private affairs, for six months (intended to extend from January to July, 1850) might be allowed to continue on leave for six months longer, if the College arrangements would admit of it. The Resident urged, that shortly after his arrival at Indore, Ahmud Ali had been introduced to the Maharajah, and entertained by the young Chief as Persian tutor, and that as it was impossible to prevail on any competent teacher to go to that part of the country, he would exceedingly regret, if Ahmud Ali should be compelled to return to his College duties immediately. Mr. Hamilton solicited that six months' additional leave without pay should be granted to Ahmud Ali, with the understanding, that if at

	* 1849.	1850.	
Candidates,	25	6	Arabic and Persian Departments.
Successful,	3	3	
Candidates,	6	16	Sanscrit Department.
Successful,	1	4	

the expiration of that period he did not appear to require his situation at Dehlie, his name should be struck off the establishment, and his appointment declared vacant. Upon the Committee stating that the arrangements in force for the performance of his duties at the College occasioned no detriment to the class, the leave solicited was granted.

Mookund Lall, a senior scholar of the College, proceeded to Calcutta to study at the Medical College, and a disbursement of Rs. 50 was sanctioned as travelling allowance.

On July 1st, 1850, Mr. J. Cargill was appointed Principal of the College, but in acknowledgment of Mr. Taylor's long and faithful services in the appointment which he held, a personal allowance of Rs. 100 per mensem, in addition to his usual salary as Head Master, was assigned to him, on the recommendation of the Committee.

On a reference from Mookund Lall, formerly a student in the Dehlie College, but then studying in the Medical College at Calcutta, it was determined that under the terms of the Circular of this Government to the several Colleges in the North Western Provinces, dated 14th July, 1847, Mookund Lall was entitled to retain his Dehlie scholarship for the term of three years from the time of his entering the Medical College, in addition to the usual allowance to the Medical students in that College, and that the above term of three years might be extended to five years on the special recommendation of the Council of Education. As regards the Robertson scholarship, the original proposal was to grant 10 Rs. a month for a period of four years to any qualified resident of the North Western Provinces, who might be willing to proceed to Calcutta for the purpose of studying Medicine, and it was contemplated two of these years would be passed in some preparatory Institution, and the other two in the Medical College. Supposing the student to possess no other means of support, the Robertson scholarship would certainly be held during these last two years, together with the Medical College allowance; but as Mookund Lall would, however, still draw his Dehlie scholarship, it would be more consonant to the intentions of the donor of the Robertson scholarship, to discontinue that stipend as soon as the recipient was otherwise sufficiently provided for, and to hold it available for others who might hereafter need it. Mookund Lall was accordingly informed by the Council, that he would continue to receive his Dehlie scholarship for three years, but that his Robertson scholarship would cease from the date of his becoming a stipendiary of the Medical College.

Mr. H. H. Roberts, a student of the College, and a senior scholar, was anxious to study Medicine at the Medical College in Calcutta, retaining his scholarship allowance; but the application could not be entertained, since the rules in force only admitted the absence of one scholarship-holder from the College, at a time, on this footing.

BENARES COLLEGE.

59TH YEAR.

Return of the Local Committee, as on the 30th of April 1851.

NAMES.	DESIGNATION OF OFFICE.
E. A. Reade, Esq., President, ..	Commissioner.
H. B. Harington, Esq., ...	Civil and Sessions Judge.
Alexander Shank, Esq., ...	Collector and Magistrate.
St. George Tucker, Esq., ...	Joint Magistrate.
Major W. M. Stewart, ...	Agent to the Governor General.
Dr. D. Butter, ...	Post Master.
James G. Gordon, Esq , ...	Merchant.
Rajah Ishwariprasada, ...	
Narayana Singh Bahadoor, ...	Rajah of Benares
Rajah Sutticharan Ghoshal, ...	
Babu Rajendra Mittra, ...	
Babu Ramprasan Singh, ...	
J. R. Ballantyne, Esq., L. L. D. ..	Secretary Local Committee P. I.

Establishment of the English Department of the Benares College, as on the 30th April 1851.

Names.	Designations.	Amount of Salary.	Date of Appointment.
		R. A. P.	
J.R.Ballantyne, Esq., L.L.D.,	Principal	600 0 0	3rd Jany., 1846.
G. Nicholls, Esq., ...	Head Master, ...	400 0 0	1st Jany., 1835.
D. Tresham, Esq.,* ..	Second Master, ..	200 0 0	5th Sept., 1840.
Babu Mathuraprasada Misra,	3rd Ditto, (Offg.),	150 0 0	17th April, 1847.
Ditto Shiva Shunkara Singh, ..	4th Ditto, ...	100 0 0	9th March, 1842.
Ditto Kidarnatha Paludhy, ..	5th Ditto, ...	50 0 0	21st May, 1846.
(Office Vacant), ...	6th Ditto, ...	50 0 0	
Pandit Ramjashana, ...	Anglo-Sanscrit Teacher,	30 0 0	1st March, 1849.
Babu Prankishun Ghose, ..	Writing Master, ..	20 0 0	11th July, 1848.
Ditto Amarnatha Mittra, ..	Librarian, ...	30 0 0	1st July, 1848.
Moulvee Jalalooddin, ...	1st Urdoo Teacher, ..	50 0 0	7th Nov., 1847.
Munshi Jagannatha Das, ..	2nd ditto ditto, ..	25 0 0	7th April, 1845.
Pandit Badri Lal, ...	1st Hindi ditto, ..	50 0 0	1st October, 1838.
Ditto Lokenatha, ...	2nd ditto ditto, ..	25 0 0	17th April, 1847.
	2 Peons @ 4 each, ..	8 0 0	
	2 Chowkidars, @4ea.,	8 0 0	
	1 Daftri, ...	5 0 0	
	1 Farash, ...	4 0 0	
	1 Water-bearer, ..	5 0 0	
	1 Sweeper, ...	3 0 0	
F. E. Hall, Esq., M. A., ..	Supy. Eng. Teacher,	300 0 0	18th March, 1850.
Mr. Benj. Concannon, ..	Ditto ditto, ..	75 0 0	1st Jany., 1851.
Moulvee Abdul Ali, ...	Supy. Persn. Teacher,	25 0 0	1st April, 1849.
Bhagwan Das, ...	Ditto Hindi ditto, ..	10 0 0	18th April, 1844.
House rent of Dr. Ballantyne,	Principal, ...	50 0 0	
Ditto of Mr. Nicholls, ..	Head Master, ...	50 0 0	

* Previous service dating from the 12th September 1833, when appointed 2nd Teacher in the Allahabad School.

Establishment of the Sanscrit Department of the Benares College, as on the 30th April 1851.

Names.	Designations.	Amount of Salary.	Date of Appointment.
Ishwardatta Pande,*	Assistant Secretary, ..	50 0 0	27th Dec., 1842.
Narayana Shastri, ...	1st Prof. of Grammar,	60 0 0	1st May, 1833.
Deodatta,†	2nd ditto ditto, ..	32 0 0	Ditto.
Durgadatta,..	3rd ditto ditto,.. ..	30 0 0	1st Sept., 1842.
Hiranund Chaube, ...	Professor of Poetry, ..	80 0 0	1st June, 1827.
Umaram Pandit,..	Ditto Vedanta,.. ..	80 0 0	1st Feb., 1825.
Kaliprasada Bhattacharjea,..	Ditto Logic, ...	80 0 0	18th Feb., 1847.
Kashinatha Shastri, ...	Ditto Sankhya, ..	80 0 0	1st Jan., 1826.
Gulzar Chaube, ...	Ditto Law, ...	80 0 0	5th Dec., 1837.
Lujjashankara Pandit,.. ..	1st Prof. of Astronomy.	80 0 0	1st Feb., 1825.
Nandlal Pandit, ...	2nd ditto ditto, ..	32 0 0	Ditto.
Bapu Deva Shastri,‡ ..	Prof. Natl. Philosophy,	80 0 0	15th Feb., 1842.
Maulavi Mahomed Ahsan, ..	1st Arabic Teacher, ..	82 0 0	1st Jan., 1848.
Munshi Vessevashurprasada,	2nd Persian ditto, ..	20 0 0	1st Oct., 1841.
Jadunatha Pandit, ...	Librarian, ...	50 0 0	1st May, 1820.
Radanatha Chuckerbutty, ..	English Writer, ...	32 0 0	1st May, 1851.
Kanahyalal,..	Hindi ditto, ...	8 0 0	15th Jan., 1842.
Haro Dutt, ...	Daftri, ...	8 0 0	1st Oct., 1829.
Rumzan, ...	Jamadar, ...	7 0 0	15th Feb., 1820.
	3 Peons @ 4, ...	12 0 0	
	2 Farashes, ...	7 0 0	
	2 Water-bearers, ..	8 0 0	
	2 Bell-strikers, ...	5 0 0	
	1 Sweeper, ...	2 0 0	
	House rent, ...	25 0 0	
Gopal Bhatta,§	Pensioner, ...	20 0 0	19th Feb., 1829.

* Was Law Professor in this Institution on a salary of Rs. 80 per mensem.

† Was student of the College, promoted to the Professorship on Rs. 16 a month, (increased to Rs. 32 in October 1841.)

‡ Was a Teacher of Natural Philosophy in the Sehore School.

§ Was Professor of the Veda at this College.

Statement exhibiting the number of Scholarship-holders and Pay and Free Pupils in the several Departments of the Benares College, as on the 30th of April 1851.

Sanscrit Department.			English Department.			Persian Department.			Total.			Total of all.
Pay Pupils.	Scholarship-holders.	Free Pupils.	Pay Pupils.	Scholarship-holders.	Free Pupils.	Pay Pupils.	Scholarship-holders.	Free Pupils.	Pay Pupils.	Scholarship-holders.	Free Pupils.	
0	38	62	102	11	38	11	9	8	113	58	108	279

2 Ghoshal Scholarship-holders, of whom each receives a moiety.

Statement exhibiting the number of Students studying different languages in the Benares College, as on the 30th of April 1851.

Sanscrit.	Persian.	English.	Hindi.	Urdoo.	Remarks.
104	51	177	99	77	

Reading Sanscrit belonging to English Department, ... 4
Reading English belonging to Sanscrit Department, ... 21
Reading English belonging to Persian Department, ... 5
Reading Persian belonging to English Department, ... 23

Statement exhibiting the Number, Caste, &c., of the Pupils in the several Departments of the Benares College, as on the 30th of April 1851.

Sanscrit Department.			Persian Department.			English Department.			Total of all Castes.		
Hindoos.	Mohomedans.	Christians.	Hindoos.	Mohomedans.	Christians.	Hindoos.	Mohomedans.	Christians.	Hindoos.	Mohomedans.	Christians.
100	0	0	16	12	0	143	6	2	259	18	2

Average daily attendance, Sanscrit Department, ... 75
Ditto ditto, Persian Department, ... 23
Ditto ditto, English Department, ... 130

Statement exhibiting the Number and Names of Students of the several Departments of the Benares College, who have obtained employment from the 1st May 1850 to 30th April 1851.

Number.	Names.	Age.	Date of Admission.	Number of Years in the Institution.	Name of Employment.	Salary.				
1	Ramgopal Bhattacherjea,	16	November 1845,	5 Years,	Private Teacher,	10	0	0	English	Department.
2	Haranchandra Chuckerbutty,	18	Ditto,	5 Years,	English Writer,	15	0	0	Ditto	Ditto.
3	Ramcomul Chuckerbutty,	15	January 1849,	2 Years,	English Ditto,	15	0	0	Ditto	Ditto.
4	Nubkishun Chatterjea,	18	October 1846,	4 Years,	Ditto,	10	0	0	Ditto	Ditto.
5	Kedarnatha Banerjea,	16	November 1846,	4 Years,	English Teacher,	15	0	0	Ditto	Ditto.

Statement of Receipts and Disbursements of the Benares College, during the official year 1850-51.

Resources of Income.								Actual Charges during the year.		
Separate Funds.		*Assignment from Parliamentary Grant.*	Total.	*Assignment from Additional Grant.*	*Establishment fixed by Government.*	*Tuition Fees.*	*Grand total of Receipts.*	Nature of Charges.	*Items.*	Total.
A separate grant from Govt. Rs. 20,000 ₹ annum or Co.'s Rs. 1701-1-9 ₹ mensem,	20413 5 0							Principal, ...	7200 0 0	
								English Teachers, ...	12000 0 0	
								Vernacular ditto, ...	11592 0 0	
								Deputy Secretary, (Sanscrit),..	600 0 0	
Interest of Co.'s Paper belonging to the College amounting to Co.'s Rs. 1,35,000 @ 472-14-2 ₹ mensem,	5674 10 8		26897 15 8	16308 0 4	42396 0 0	1168 0 0	*47953 7 10	Establishment of both Departments,	2562 0 0	
Exclusive of the following Items.								English Scholarships, ..	1192 0 0	
								Sanscrit ditto, ...	2489 0 0	
Balance of last year, ...		89 8 1						Persian and Arabic ditto, ..	713 0 0	
Book allowance from Government,.. ..		498 4 0						Prize for both Departments, ..	150 0 0	
Apparatus Grant, ...		150 0 0						Persian, (Sanscrit), ...	240 0 0	
Prize allowance for both Departments, ..		150 0 0						House rent of Principal and Head Master,	1200 0 0	
Subscriptions in this Station,..		0 0 0						Postages, ...	31 5 6	
Fines realized, ...		1 0 0						Medal allowance, ...	0 0 0	
Books, ...		0 0 0						Rents for both Colleges, ..	382 0 0	
Medal allowance from Government, ..		0 0 0								40351 5 6
Admission fees, ...		0 0 0								
Tuition Fees, ...		1168 0 0						Village School Superintendence	1116 0 0	
Postages from Government, ...		31 5 6						Supernumerary Masters, ..	4758 5 4	
Ghoshall Scholarships,..		200 0 0								5874 5 4
Additional grant for purchase of Sanscrit Manuscripts,		500 0 0								46225 10 10
			2788 1 7					Tuition, &c.,..	1168 0 0	
Expended for Books, Stationery, Scholarships,		1155 8 6						Sale of Books, .. .	59 13 0	
Ditto for purchase of Sanscrit Manuscript,		315 0 0						Amount from Government for Sanscrit Manuscript,	500 0 0	
			14470 8 6							1727 13 0
Balance on this date, ...		16 4 4								
Ditto for Sanscrit Manuscript, ...		185 0 0						Grand Total Co.'s Rs., ..	..	*47953 7 10
			201 4 4							

It will have been observed from one of the foregoing statements, that the number of pupils at this College, on the 30th April 1851, was 279. This when compared with the corresponding statement of the preceding year, gives an increase of 39. But this increase, it will be further remarked, is almost exclusively in the Sanscrit Department, which exhibits an advance of 41, whilst that of Persian numbers only two more than the former year and the English numbers five less. The advance is, however, mostly nominal, as will be explained by the following remarks of Dr. Ballantyne.

"It has been more than once objected to the Benares Sanscrit College, that the number of pupils is small, the staff of Pundits and their pay great, and the estimation again in which our Pundits are held in the city small. Now the number of pupils, if by pupils we mean persons availing themselves of the advantages offered by the Institution, is not so small as has been generally supposed; the staff of Pundits is not greater than we require, nor is their pay greater than they worthily earn; and the estimation in which our Pundits are held is best evidenced by the fact that numerous disciples haunt the College clandestinely, objecting to have their names entered on the books, because this would subject them to the vexation of having to sit doing nothing till the closing of the gates, after having obtained the information they wanted. The enquirers of the "porch" or of the "grove" were subjected to no such unprofitably Procrustean interference with their time, and as I should like the Sanscrit College to be regarded, like one of these classical spots, as a place to which the philosophical enquirer might resort cheerfully for the resolution of his difficulties (supposing the resolution thereof to be within the competence of the Professors,) an order has been issued in the meantime that all may come who choose, and welcome, but, that all who come must put down their names, so that the whole machinery of the College may not be liable to be represented as being exclusively employed about those students (some sixty in number) who undertake to attend from the opening till the closing of the gates. The ostensible encrease in the attendance of the Sanscrit College is not however wholly due to the enrolment of the names of those who were previously taught there, without being enrolled.

"A considerable influx of juvenile students has been the result of the measures recently adopted for the encouragement of the study of Hindi by youths beginning Sanscrit."

On the above subjects, it was remarked by Government, that there was no objection to the Pundits rendering occasional assistance to out-students, provided the time of the Pundits was not thus too much diverted from their proper duties, but that such occasional enquirers should not be reckoned among the regular students in the College.

ENGLISH DEPARTMENT.

Major Stewart, Mr. F. B. Gubbins, Dr. Butter, and Mr. Gordon were the members of the Committee, who took part in the examination of this Department. Those classes which were not examined by members of the Committee were examined by the Head Master, Mr. Hall, and Dr. Buch, and the Principal himself.

SENIOR DEPARTMENT.

Out of the seven boys of the 1st class in this division, two are marked as studying Law, and one as preparing for Roorkee College. With regard to the rest, they appear to have succeeded better in History, Literature and Law, than in the Mathematics and Natural Philosophy. Mr. Nicholls considers the Mathematical papers inferior to what have been done in former years, and Dr. Butter remarks concerning their Optics and Astronomy, "The answers show that the "pupils have been well taught in other departments of study, but "trust largely to their imagination in answering the questions im-"mediately before them." A passage however from Dr. Ballantyne's Report must here in justice be inserted: "It is only within the last fortnight that there has been a Telescope in the College. When our arrangements for experimental illustration, &c., &c., without which it is hopeless to teach Physics satisfactorily, shall be completed, it may be anticipated that the boys will understand better what they read about."

The 2nd class numbered nine boys: out of these, however, seven only came to the examination. With this class, as with the first, the knowledge of Natural Philosophy was found very superficial. The progress of the 3rd class was reported on unfavorably. Dr. Ballantyne thinks it due, however, to mention that Mr. Tresham had had unusually onerous duties during the session, in consequence of the severe illness of the Head Master. He thinks it would have been better, if Mr. Tresham had not attempted, under the circumstances, to carry out the Programme of studies, but had limited the reading of his pupils. Dr. Ballantyne records with gratitude the active and cheerful diligence of his colleague, Mr. Tresham.

JUNIOR DEPARTMENT.

In the 1st class thirteen boys presented themselves for examination. Dr. Buch does not report very favorably of their Arithmetic and History. In Arithmetic, though they worked out their operations fairly, they did not seem to apprehend the reason for what they had done; and in History a deficiency was remarked in answering any question in their

own words; the questions in Grammar and Geography were on the whole satisfactorily answered." Of the Hindi of this class, Mr. Hall says, "Most of Budri Lal's pupils can explain Tulsi Dass's Ramayana with considerable accuracy; more attention should however be paid to the peculiarities of grammatical construction and poetical licence employed in their text-book." The Reading, Explanation, and Grammar of the 2nd Class Dr. Buch was much pleased with. He recommended however the boys being more exercised in English Explanation. Their Arithmetic was, like that of the 1st class, creditably performed. Mr. Hall reported highly of the Urdoo and Hindi. Major Stewart said of the 3rd class, "The boys severally read well and distinctly, and appear to understand what they read. Their knowledge of Geography is good, and on the whole they do much credit to their teacher, Sheoshunker Singh."

There are three sections of the 4th class. Mr. Gordon was well pleased with the result of his examination of the 1st section; the 2nd and 3rd sections have not recovered the neglect of a former Master, Babu Setul Pursad Gupt, but hopes are entertained of their improvement.

"Dr. Ballantyne remarks in his Report, "it is probable that Mr. Hall "and Dr. Buch, in forming an estimate of the merits of the boys in the "junior Department, were guided (perhaps unconsciously) by their "recollection of the relative fluency of boys of the same standing in "the school at Calcutta. It is however but fair to the boys here to "bear in mind that they have no opportunity of hearing English "spoken, except in the College, and during College hours. This is "not the case in Calcutta. A Calcutta boy may reasonably therefore "be expected to make a much better figure, in giving, *extempore*, "an account of what he has read, than a Benares boy who is equally "acquainted with the subject."

He continues afterwards, "Of the youths of the senior Depart-"ment who have read with me during the session, two, viz., Gobind "Chundur Sandel and Ram Kali Chowdhery, went through a play of "Shakespear's, an exposition of the Sankhya Philosophy, half a volume "of Mill's Logic, and a volume and a half of Whewell's History of the "Inductive Sciences. After going through this, (in addition to their "reading with Mr. Nicholls and their Sanscrit teacher,) they turned "their attention to the study of Law, with the approval, and under the "direction, of Mr. E. A. Reade, the Commissioner, who will, I hope, in his "minute, report on their progress." Mr. Reade did so; the following is an extract from his minute: "The youths Gobind Chundur Sundyal "and Ram Kali Chowdhery have read the Directions to Settlement "Officers, the Directions to Collectors, Skipwith's Magistrate's Guide "and some of the Chapters of Marshman's Guide to the Civil Law. They "have, as I suggested, attended me on the first Wednesday of each month, "and been examined in their previous month's reading. I have "been gratified with their attention and intelligence, and heartily "recommend the continuance of their stipends."

The Lieutenant Governor observed that the arrangement, by which these youths continued to retain their scholarships, while studying Law, though they had ceased to attend the College classes, was an unusual one, and that he considered it open to abuse. His Honor would not refuse his sanction to the measure for the current year, but desired that the concession might not be drawn into a precedent for the future.

ARABIC AND PERSIAN DEPARTMENT.

The number of students who were candidates in this Department for junior and senior scholarships was fifteen, and of students not competing for scholarships, eight. The Report appears to be favorable to their attainments. The following remarks of Dr. Ballantyne may here be inserted. "The lads whose scholarships now lapse "have sent in a petition that they should be put on the same footing "with the Anglo-Sanscrit class, professing themselves ready to apply "to the study of English, if the scholarships be continued. This "arrangement I am not at present prepared to recommend. At "Dehlic, indeed, an English class of thoroughly Arabic educated "scholars might be established, with advantages somewhat analogous "to what we look for here from the English class of Pundits; but I "could not at present, and with the aids available, offer to take the "charge of a new Department of this kind here. I have therefore "intimated to these lads, that I can promise them nothing further "than that if they choose to begin English they shall be admitted as "free scholars. If we could establish an Anglo-Arabic Department, "I should be very glad of it; for I am convinced that there is about "as little chance of an English pupil in our Colleges becoming "afterwards a thorough Arabic scholar, as there is of his becoming a "thorough Sanscrit one. Once accustomed to English tuition, our "pupils feel a repugnance towards the dry and thorny details of the "other disciplines; so that if we wish to have a man perfect in both, "we must build the English on the others, and not *vice versâ*. This "is precisely what is done in Europe, where the details of the "classical languages, if not grappled with in boyhood, are rarely mastered "at all."

The Lieutenant Governor agreed with the Principal as to the inexpediency of establishing an Anglo-Arabic class at present on the above footing in the Benares College, and observed that it was only when great proficiency has been attained in a native learned language that it became of importance to induce the possessor of it to learn English by continuing to him his scholarship with this view.

THE SANSCRIT DEPARTMENT.

Of this important Department, Dr. Ballantyne writes: "The con- "duct of the teachers, and the progress of the pupils in the Sanscrit "Department during the session have been satisfactory. In addition to

"the regular branches of Sanscrit learning studied in the College, the "Logic of Europe continues to be taught by the Nyaya Pundit, and "European Astronomy, Mathematics and Mechanics, by Pundit Bapu "Deva. A tolerable telescope having been lately procured, the Pundit "has been able to show to his pupils some of the celestial phenomena "which they knew previously by description. In particular, he had "a good opportunity of exhibiting the planet Venus when reduced to "a very slender crescent. It was interesting to observe the surprise "depicted on the faces of a large party of Astronomers, congregated on "the lofty roof of the Pundit's house in the city, as each one saw "the star developed into its crescent form. The moon happened "fortunately to be close by, presenting an exact repetition of "the form upon a large scale, and leaving no room for doubt as to "the real cause of the phenomenon. Bapu Deva's pupils appeared "in high spirits on the occasion, and quite delighted at being able to "give this ocular demonstration of the correctness of their College "class-books to their less enlightened and not a little astonished "friends among the Astrologers of the city. We shall, I hope, be "able to employ the telescope frequently to demonstrate the accuracy "of the Astronomical predictions of Europe, by referring to the table "of the relative positions of Jupiter's moons, and letting the doubter "select, a month or two in advance, the arrangement of any given "evening to be tested. I am sorry that the want of appliances pre-"vents at present our bringing the Experimental divisions of Physical "Science more prominently forward in the Sanscrit Department. We "shall have more conveniences for this in the new College building."

THE HINDI CLASS.

Dr. Ballantyne remarks, "The addition of a Hindi class to the "Sanscrit Department (in pursuance of the plan suggested in para-"graph 20 of the Report for 1849,) has answered well, and I trust "it will answer still better when we shall be better provided with real-"ly useful Hindi books. Bapu Deva's Hindi digest of European Alge-"bra, I am glad to say, is now printed. He is now preparing, among "other things, a Hindi version of his own Sanscrit treatise on the cal-"culation of Eclipses by the European method."

The following table will afford a view of the distribution of the scholarships in the several Departments, as proposed by the Committee and sanctioned by the Government.

Allotment of Scholarships in the English Department.

Names.	*Age.*	*Date of admission.*	*No. of Marks.*	*Amount of present Scholarships.*	*Increase recommended.*	*Total.*	*Remarks.*
SENIOR SCHOLARSHIPS.							
Gobind Chunder Sandel,	21	Decr. 1837,	0	20	0	20	*Vide* 9th Para. of the Head Master's letter.
Ramkali Chaudhery,	20	Novr. 1841,	0	20	0	20	
Kasheeprasad Chatterjee,	17	Ditto,	58	10	6	16	
Chundernath Mitter,	17	Sept. 1843,	41	10	8	18	
Ram Chunder Sein,	15	April, 1849,	72	10	6	16	
JUNIOR DEPARTMENT.					*minus.*		
Bachan Lall,	20	Augt. 1838,	0	8	8	0	Scholarship forfeited.
Grish Chunder Sandel,	16	Feby. 1841,	56	6	4	10	
Sitanatha Mitter,	16	Jany. 1844,	51	6	4	10	
Ganesh Chaubé,	17	June, 1844,	58	8	2	10	
Harinath Ghosal,	18	Novr. 1850,	38	0	8	8	

Ghosal Scholarships.

Names.	*Age.*	*Date of admission.*	*No. of Marks.*	*Amount of Scholarships.*	*Increase recommended.*	*Total.*	*Remarks.*
GHOSAL SCHOLARSHIP.							
Biseswara Bhattacharjea,	17	May, 1847,	41	8	0	8	
Surjkaunt Chatterjea,	15	Ditto, 1844,	12	0	8	8	

Allotment of Scholarships in the Arabic and Persian Departments.

Names.	*Age.*	*Date of admission.*	*No. of Marks.*	*Amount of Scholarships held.*	*Increase.*	*Amount of Scholarships recommended.*	*Remarks.*
SENIOR ARABIC.							
Vacant.							This scholarship held hitherto by Mohumed Musa, lapses, he having held a senior scholarship four years.
JUNIOR ARABIC.							
Mahomed Ruza, ..	18	Jany. 1844,	62	0	0	8	This youth is above age but meritorious, and may qualify next year for a senior scholarship.
Abdussamed, ...	16	Novr. 1848,	66	0	0	8	
SENIOR PERSIAN.					*minus.*		
Baijnath Prasad, ..	18	Jany. 1845,	80	8	8	0	This lad's scholarship lapses, he having held it for the last six years.
Bechu Sing, ...	18	Jany. 1844,	58	8	0	8	
Krishna Chundra, ..	19	May, 1844,	55	7	0	7	
Uvudhbehari Lall,	15	May, 1849,	62	0	0	6	
JUNIOR PERSIAN.							
Mohan Lall, ...	17	Jany. 1844,	38	6	0	6	
Nand Kishore, ...	15	July, 1849,	47	0	0	5	
Sivanandana Sing, ..	17	July, 1849,	33	6	0	6	
Sagid Ali, ...	14	Sept. 1849,	55	0	0	5	

Allotment of Scholarships in the Sanscrit Department.

NAMES.	AVERAGE NUMBER OF MARKS.	AMOUNT OF SCHOLARSHIPS.
SENIOR SCHOLARSHIPS.		
Sitalaprasada Tivárí, ...	18	16
Tárádata Joshí, ...	18	14
Suvansá Choube, ...	14	11
Náráyana Pantha, ...	16	10
Viswanatha Dúbe, ...	18	10
JUNIOR SCHOLARSHIPS.		
Ramadína Purohita, ...	14	7
Bhavíama Misra, ...	16	7
Kasínatha Dúbé, ...	15	7
Venisankara Vyasa, ...	17	7
Syama Tivárí, ...	15	7

Allotment of Scholarships in the Sanscrit Department—(Continued).

Names.	Average Number of Marks.	Amount of Scholarships.
Junior Scholarships.		
Brahma Datta Misra, ...	18	2
Siranarayana Tivárí, ...	18	2
Basantarama Jha, ...	18	2
Dwarakanatha Upadhyaya, ...	19	2
Srinatha Sukula, ...	17	2
Balamukunda Sukula, ...	15	2
Visweswarra Sukula, ...	16	2
Rama Dasa Sukula, ...	16	2
Srirama Sastree, ...	17	2
Gungarama Santri, ...	14	2
Mahesaprasada Sukula, ...	15	2
Kesavarama Vyasa, ...	17	2
Baladeva Upadhyaya, ...	20	2
Jayadeva Upadhyaya, ...	20	2
Vindyaprasada Sukula, ...	20	2
Venayake Dúbé, ...	0	2

The following extract from the Principal's Report regarding the Anglo-Sanscrit class will be read with interest.

"The progress of the English class of Pundits is to me most "gratifying. With their aid, I now hope to effect much that I could "not have hoped to effect without it. Aided by these men, I shall "now listen with simple disregard to the discouraging reiterations of "those, who insist that the truths of Science and of Philosophy cannot "be communicated to the Hindoos, without the use of words which "would go to barbarize their languages—as if a language richer in "roots than any European one, and far more finely organized, could "not supply as many available terms; as if the Sanscrit needed "instruction at the hand of its grand-child, the Greek. To render "intelligible our plan of operations for the next session, I may "remark that my first attempt to open a communication with the "frequenters of the Sanscrit College, was made in the shape of a set "of lectures on the Circle of the Sciences. The Sanscrit version of "these lectures was carefully revised by Pundit Bapu Deva, whose "rendering of many of the scientific terms was most felicitous. I "learn that these renderings have been incorporated into the English "and Sanscrit Dictionary now preparing by Professor Monier "Williams, for the use of the College at Haileybury. In those por-"tions of the lectures which related to Sciences which this Pundit "had not studied, we were less successful than in the others. To "ensure success, it would have been indispensable to investigate the

" first sources of the nomenclature already appropriated to the same
" or kindred topics in the Hindoo philosophy; and how I propose that
" this shall now be done I proceed to state. The multitudinous
" treatises in the six great Schools of Hindoo Philosophy are all based
" upon, and are held to be of authority, only in so far as they coincide
" with, the six collections of Aphorisms promulgated severally by the
" six founders of the Schools. The Aphorisms were intended, not to
" convey the doctrine, but to record it; hence their oracular brevity.
" They resemble in some measure such formulas as that of the Bino-
" mial theorem, which, *when once explained*, enables one to recollect
" readily a complicated series of operations, which if expressed in
" words at length, no human memory could have retained a know-
" ledge of. The Aphorisms, therefore, from the first, were attended
" by a comment, oral or written; and the written Commentaries are
" now so voluminous that the generality of students do not venture
" to grapple with the Aphorisms at all, but confine themselves to
" compendious manuals and text-books, of which there is abundance.
" One obvious and undesirable consequence of this is, that if you are
" arguing with an educated Hindoo and the quiver of his text-book
" fails him, he ensconces himself in the conviction that the case is
" by no means desperate, while there remain untold stores of arms
" in those dark armouries, the aphorisms. This of itself would fur-
" nish a sufficient reason for wishing that these dark armouries
" should be lighted up. But this is not the only reason. Only by
" tracing the development of Hindoo thought, and of the terminology
" in which it clothed itself, can we hope to avoid completely all such
" misappropriation of terms, as that which has, to a certain extent,
" baffled all European attempts at translation into the Hindoo dialects
" whenever the subject of discussion transcended the palpable. But
" there is yet another reason why I wish, with the aid of our Eng-
" lish Pundits, to exhibit in broad clear light the sources of the Hindoo
" Philosophy, and it is this—that the Hindoo Philosophy is in
" Europe too often provokingly misrepresented. I lose patience when
" I find Dr. Ritter in his voluminous 'History of Philosophy'
" (Vol. IV. p. 366) asserting that 'in its exposition, the Nyaya is
" tedious, loose, and unmethodical,' and going on to say, 'indeed,
" the whole form of this Philosophy is a proof of the incapacity of its
" expositors to enter into the intrinsic development of ideas.' The
" Nyaya was tedious to Dr. Ritter because he did not understand it;
" it was 'loose' in his eyes as the chain-cable heaped upon the
" deck of a man-of-war looks 'loose' in the eyes of a landsman
" who never saw it stretched; and it looked 'unmethodical' to
" him, because he did not see the method. I do not complain of
" Dr. Ritter and other libellers of Hindoo Philosophy for not seeing
" the method; but I do complain of them for their coolly deny-
" ing the existence of what they happen not to see.

" The rise of the erroneous notion that the Hindoo systems are " disjointed and ill-arranged, I attribute, in a great measure, to the " extreme caution of Mr. Colebrooke, who in his account of the Hindoo " Philosophy, confined himself so rigidly to the rendering of detached " passages without in general suggesting the links of transition, that " his followers, finding no thread of connection indicated, imagined " themselves entitled to assume that none existed. The best of my " pupils have entered warmly into my design of preparing an edition " of the Aphorisms, with so much of the comment as is illustrative " without being tedious, the Sanscrit being accompanied by an " English version. Venkatrom Sastri in particular (who is ambitious " of rendering the various works prepared for the College, including " Bapu Deva's Algebra and my Laghu Kaumudi, into his native " Telugu) has shown himself enthusiastic in the matter. Where " commentaries were required to be referred to that were not in the " College Library, he has spared no toil in searching for copies in the " city, and no efforts of persevering persuasion to obtain a loan of " copies, which the owners were not always very willing to lend. We " have already made some progress in the work. A portion of the " Aphorisms of the Atomic Philosophy (the *Vaiseshika* of KANADA) is " in type, and the proof-sheets of the English version have been " carefully read and criticised in the class. A portion of the version " of the Nyaya Aphorisms is also in the hands of the Printer. The " versions of the *Vedanta*, the *Mimansa*, &c., are in preparation, and " I propose, seeing that the scope of the whole Philosophy can gene- " rally be gathered in each case from the opening section, to bring " out the opening section of each before completing any. Thus, the " first section of the Nyaya Aphorisms will contain, for example, the " materials out of which Mr. Colebrooke's Essay on the Nyaya was " constructed.

" The books thus prepared with the aid of the class of Pundits " are further intended to supply Sanscrit books for the Senior " students of the English Department, in pursuance of the design of " bringing the two Departments to a better mutual understanding. " I intend also that they shall be turned into Hindi, and read in the " Hindi classes. An intelligent and liberal minded Pundit remarked " to me some time ago that he was frequently puzzled by Mahajuns " and others asking him, what *is* it that is in your Shastras? Can " you give us some notion of what you find so valuable there? Now, " continued the Pundit, what *can* I say in reply? How can a man " be made to understand what is in the Shastras, but by being set to " read them? I told him of my design to render the Aphorisms " available to the general reader; and he welcomed the proposal " cordially. Of course, it is not all Pundits who will do so. As " a first step in this direction, a Hindee version of my edition of the

"Tarka Sangraha has been prepared, and it is now nearly through the "Press. Whilst employing the English class of Pundits to assist in "bringing the Hindoo Philosophy into the light, I intend that they "shall carry on, parallel with this enquiry, an enquiry into the Induc-"tive Philosophy of modern Europe. For this purpose, we have com-"menced upon Mr. John S. Mill's 'System of Logic, Ratiocinative "and Inductive.' I extracted the passages that are useful to us, omit-"ting all that concerns the European reader alone, such as the mis-"takes of Reid and others respecting the nature of Logic, &c.; and the "passages adapted to our purpose I interweave in a Commentary "modelled on the plan of a Sanscrit Commentary, pointing out the "thread of connection in the speculation, and, in particular, dwelling "upon each fundamental term in our Philosophical nomenclature, and "discussing its relation to the terms of the Hindoo Philosophy. "The interest that my best pupils take in this enquiry is every thing "that could be wished. We have barely entered upon it, we are at "present stopped by the tedious torpidity of the Indian printing Press. "If there were a printing Press attached to the College, which Mr. "Tresham would willingly superintend, we might get on with-"out the vexing delays to which we are from time to time subject "under existing circumstances. I think of completing my exposition "of Mr. Mill's views before returning to the "*Novum Organum*' in "regard to which my pupils and myself should by that time be better "prepared to understand each other.

"But to leave the future and revert to the past session. In the "teaching of this class, as in all matters connected with the Sanscrit "College, I have received the most satisfactory assistance from my "valued coadjutor, Mr. F. Edward Hall. With Mr. Hall, the Pundits "have read the History of England as far as the reign of James the "first, and various portions of the English version of my Sanscrit "Lecture. The five men distinguished in the table by an asterisk, have "made great progress during the year, and they are now beginning "to look into all kinds of books in search of those treasures of knowledge "which were promised them as the reward of a knowledge of English. "There is now not nearly so much difficulty in satisfying them respect-"ing those idiomatic (and occasionally but loosely compacted) sentences, "that occur in works written in a familiar and negligent English "style; but their preference for strictly accurate composition is in "no degree diminished. In order to show them that we have works "written as carefully as any of their own, I selected, for one portion "of their reading with myself, the Dialogue on Art by Harris, the author "of the 'Hermes.' As regards the choice of the subject, I was moved "by the desire to make them aware of the application respectively "of our three terms Philosophy, Science, and Art, to which no three "terms in their established terminology exactly correspond. They "were delighted with the precise and methodical treatment of the

"enquiry, but they protested unanimously against the unfairness "of putting both the objections and their solutions into the mouth "of one of the interlocutors, and reducing the other to the posi- "tion of a mere 'walking gentleman' to be 'talked to.' They "rectified this, when they turned the Dialogue into Sanscrit for their "own use, by giving the other party the credit of starting the objec- "tions, while the principal speaker retained the credit of solving them. "Vithal Sastri's condensed summary of the argument (in a couple of "pages) was particularly good. I propose to have this printed as "an Appendix to the edition of the Dialogue, which with a preliminary "Essay on the relation of Art to Science and Philosophy, has been "printed for the use of the class. The Sanscrit abstract may furnish "matter for some discussion in the Sanscrit College.

"Besides aiding in the teaching of this class, and in superintend- "ing the reading of the Junior Division of it with Pundit Ramje- "shun, Mr. Hall has relieved me of a load of labor in the correcting "of proof-sheets, thus (whilst extending his own acquaintance with "Sanscrit) enabling me to engage in other tasks which I must else "have foregone. In particular, he has relieved me of the most labo- "rious part of the revision of the proof-sheets of the English version of "the 'Laghu Kaumudi,' undertaking cheerfully the labor of collating "and verifying the numerous references, and sparing no pains to arrive "at the correct sense of terms, in regard to which, as sometimes hap- "pened, the Grammar Pundits (from being long accustomed to treat "the form without reference to the sense) were found dissentient. "In "this way, Mr. Hall has obtained such an acquaintance with the native "system of Grammar that he will be able to take the entire charge "of completing the Hindi version (for the Dehlie Vernacular Society) "of which a portion was printed some time ago, and the completion "of which was deferred until all the references should have been veri- "fied in the English version. As the preparation of the English "version (including the conducting of it through the Press) has "been a task both of time and toil, I may be permitted here, for "the instruction of my successors, who might be misled to doubt whe- "ther that time and toil had not been in some measure misapplied, to "record the opinion of Professor H. H. Wilson on the value of the "Grammar thus translated and annotated. Professor Wilson says, 'It "will be of infinite use to those who wish to learn Sanscrit substantially "and in earnest. I went through the text, as far as your translation "extends, with one of my Oxford pupils, to his great gratification and "advantage. Dr. Max Müller (the editor of the fine edition of the "Rig Veda, patronized by the Court of Directors) says of it, 'Your edi- "tion of the Laghu Kaumudi, too, I had never seen or heard of before. "It is an extremely useful publication, and it is much to be regretted "that publications like these (referring also to the Nyaya Tracts) "should remain almost unknown in Europe; at least on the Conti-

"nent.' The opinion of these two scholars may serve to justify "my selection of this and other works against less favorable opinions "expressed in India. On the subject of the Native Grammar, Dr. "Müller, I may here mention, says further 'Panini, in spite of all his "pedantry, is a great favorite of mine; no Literature can boast of a "similar work; I wish it was possible to give a complete edition of "the Mahabhashya and Kaiyyata in order to have all the Varttikas "and Paribhashas which the Ca'cutta edition (of Panini) and still "more Böehtlingk have sadly mutilated. Could you not find a Brah-"man to undertake this?' The work wou'd rejoice our Pundits, "who, whenever a new printed Sanscrit book arrives, are sure to ask "when the Mahabhashya* is going to be printed. We could easily "manage it with the new fount of types at Mirzapore, and, though "the expense would be considerable, the sale would be certain. In "anticipation of the Government's sanctioning the printing of that "portion at least (known as the Navahnica) which every student of "Grammar reads, I have made arrangements for the preparation of a "correct text.

"Mr. Hall has also aided in the preparation of a very simple "E'ementary Grammar of the Sanscrit (somewhat on the plan of Ollen-"dorff's Grammar of the German) for the use of the English Depart-"ment, where the introduction of the study of Sanskrit as a clas ical "language, has been sanctioned approvingly by Government. This "Grammar is partly ready for the Press; but we are awaiting the "arrival of a new and legible fount of types; we have taken the op-"portunity of Dr. Buch's temporary appointment to the College to "try this Grammar on a beginner, and Dr. Buch finds it so self-ex-"planatory, that it may be hoped others will find it so too."

THE LIBRARY.

The following passage is from the Report furnished to the Principal by the Head Master. "The library has had many valuable works added to it during the year, many others are, however, highly desirable. The books are generally made good use of. Fifty-four students applied for books, and the volumes lent out to them during the year have been 336. Applications for books have been made by 30 residents of the station, and 695 volumes have been lent out."

A student, named Bachun Lall, had professed an intention of attempting to pass the preliminary examination at Roorkee, and had been allowed to retain his scholarship on that ground; some doubts

* The sanction of Government to the printing of this valuable work was afterwards conveyed on the 27th May 1851; the press which should execute it and the number of copies which should be printed, being left to Dr. Ballantyne's discretion.

however having been entertained of his sincerity, payment of the scholarship was suspended till he should have passed. He went up, but was unsuccessful. Lieutenant Maclagan however reporting favorably of him, an application was made to Government to sanction the payment of arrears due to him, and also to continue the scholarship for another year to enable him to try again. The Lieutenant Governor sanctioned this proposal on 22nd of June; the student, notwithstanding, seems ultimately to have disappointed the hopes entertained of him.

On the 25th of July 1850, the Lieutenant Governor sanctioned the expenditure, at the recommendation of the Committee, of a sum not exceeding Rs. 32 a month for the assignment of stipends, Rs. 2 in amount each, for Hindi students in the Sanscrit Department. These stipends were intended to meet the objection which the Sanscrit student showed to the study of the Vernacular. The measure is at present only an experimental one.

On the 12th of September, Dr. Ballantyne reported to Government that Rs. 500 which had been recently granted for making additions to the collection of Manuscripts in the College library, especially in the department of the Mimansa Sastra, had been expended. As a list of these additions had been called for by Government for transmission to Europe, the Committee proposed that a descriptive catalogue should be prepared, enumerating not only the books in the College library, but those which could be ascertained to be extant elsewhere. The Lieutenant Governor in reply granted a further expenditure of Rs. 500, and highly approved of the plan of a general Sanscrit catalogue, but recommended that the publication should not be so long delayed, in the expectation of improving it, as to hazard its ultimate appearance. It would be better, he thought, to publish at once even an imperfect work, and to look to additions and improvements in a future edition.

ROORKEE COLLEGE.

4TH YEAR.

Statement of authorized Salaries and Establishments on the 1st May, 1851.

DATE OF APPOINTMENT.	NAME OF INCUMBENT.	DESCRIPTION OF SERVICE.	SALARY.
Oct. 19th, 1847,	Lt. R. Maclagan, Engrs..	Principal,	600 0 0
Jany. 24th, 1848,	Mr. H. Bingham,	Head Master,	300 0 0
June 8th, 1849.	Mr. W. Scotland,	Architectural Drawing Master,	200 0 0
March 1st, 1849,	Munnoo Lall,	1st Native Teacher,	120 0 0
Jany. 10th, 1848,	Beharee Lall,	2nd ditto ditto,	50 0 0
		Eight Stipendiary students 1st Department,	320 0 0
		Additional stipend,	41 4 0
		Eight Stipendiary Students Senr. Dn. 3rd Depart.,	80 0 0
		Sixteen ditto Junr. ditto,	80 0 0
		GENERAL ESTABLISHMENT.	
March 12th, 1851		1 English Writer,	35 0 0
Dec. 20th, 1850,		1 Duftree,	10 0 0
		4 Tindals @ 5,	20 0 0
		24 Khulashies @ 4,	96 0 0
		2 Chuprassees @ 5,	10 0 0
		1 Bearer,	5 0 0
		1 Chowkeedar,	5 0 0
		1 Sweeper,	4 0 0
		ESTABLISHMENT EUROPEAN BARRACK.	
		4 Cooks @ 6,	24 0 0
		3 Bhistees, @ 5,	15 0 0
		3 Dhobies, @ 6,	18 0 0
		1 Chowkeedar,	5 0 0
		3 Sweepers @ 4,	12 0 0
		Total Co.'s Rs..	2050 4 0

ROORKEE,
January 19th, 1852.

(SIGNED) R. MACLAGAN, LIEUT.,
Principal C. E. College.

FIRST DEPARTMENT.

Number of Stipendiary Students.

No. of Roll of Applicants.		Names.	Caste of Native students.	Age.	From	Date. Nomination to the College.	Arrival at Roorkee.	Appointment.	Leaving the College.	Situation.	Remarks.
1	1	Ameer Khan, ...	Pathan.	18 6	Dehlie College, ..	Feb. 3rd, 1848, .	March 12th, 1848.	Sept. 25th, 1850.	Oct. 5th, 1850,..	Sub-Asst. G. T. Survey.	
7	2	Hurree Churn, ..	Brahmin,.	20 0	Agra College, ..	June 19th, 1849,	July 12th, 1849.				
8	3	J. T. Platts, ...	.	19 4	Bedford, ...	Oct. 31st, do,	Nov 26th, do.,				
10	4	Kunhya Lall, ..	Kayuth,	18 0	Agra College, ..	April 6th, 1850,	June 24th, 1850.				
15	5	Neilmunee Mittre,	Ditto, ..	21 0	Free Church Institution, ...	Nov. 21st, 1850,	Not joined.				
		4 Vacancies,									

SECOND DEPARTMENT.

No. of Roll of Applicants.	No. on College Roll.	Names.	Rank and Corps.	Date. Nomination to the College.	Arrival at Roorkee.	Appointment.	Leaving the College.	Situation.
20	13	Patrick FitzPatrick,	Gunner, 3rd Co. Bn. Artillery,	G. O. C. C. Feb. 4th, 1849.	April 25th, 1849,	O. P. C., April 19th, 1850,	May 1st, 1850,..	Asst. Ovr., 1st Dn. G. T. Road, Hoogly.
25	14	T. E O'Donoghue,..	Do. do., 6th Bn. do.,..	April 5th, 1849,	April 25th, do.,	Jan. 15th, 1850,	Jan. 15th, do.	1st Dn G. C. Roorkee.*
28	15	Lake Dillon, ...	Do. 1st Co 6th Bn. ditto, ..	Feb. 4th, do.,	May 5th, 18 do.,	Jan. 15th, do.,	Jan. 25th, do.,	nd Dn. G. C. Munglour.
33	16	George Nolan, ..	Do 4th Co. 4th Bn. ditto, ..	April 5th, do.,	July 23rd, do.,	April 15th, do.,	May 1st, do,	th Dn. G. T. Rd Meerut.
37	17	James P. Rae, . ..	Actg. Corpl. 4th Co. 2nd Bn. do.	June 19th, do.,	July 23rd, do.,	April 19th, do.,	May 8th, od,	nd Dn G. C. Munglour.
38	18	John Wellsteed, ..	Corpl. 1st Co. 6th Bn. ditto, ..	June 19th, do.,	July 2nd, do.,	March 1850, ..	April 2nd, do.,	st Dn. G. T. Rd, Hoogly.
39	19	Charles Iwan . ..	Do. 2nd Co. 1st Bn. ditto, ..	June 25th, do.,	Augt. 2-th, do.,	May 9th, do.,	May 24th, do.,	th Dn. G. C. Cawnpore.
40	20	Samuel S orrigan,	Bugler 2nd Co. 1st Bn. ditto,..	June 25th, do,	Augt. 25th, do,	May 10th, do.,	May 24th, do,,	Eastern Jumna Canal.
44	21	William Parker, ..	Serjt. 4th Co 3rd Bn ditto, ..	Nov. 29th, do.,	Jan. 8th, 1850,	May 10th, do.,	Nov. 5th, do,	1st Dn. Ganges Canal.
45	22	Henry Mitchell, ..	Corpl. 2d European Regiment,	Nov. 29th, do,	Feb 13th, do.,	Dec. 5th, do.,		
46	23	David Deady, . ..	Actg. Serjt. 3rd Co. 2nd Bn. Ay.,	Feby. 5th, 1850,	July 25th, do.			
48	24	John F. Tannon, ..	Gunner 1st Co 3rd Bn. ditto, .	Feb. 8th, do.,	June 5th, do.			
49	25	T. P. Jones, ...	Corpl 2nd Dp. 3rd Bge. H. A.,	May 3rd, do.,	June 7th, do.			
50	26	T. H. Wilson, ...	Gunner 4th Co 3rd Bn. Arty.,	May 3rd, do.,	June 7th, do.			
		15 passed Candidates	Admission directed by	G. O. C C. Nov. 7th, 1850.	To join on the 15th Jan. 1851.			

* Has since purchased his discharge from the service.

THIRD DEPARTMENT, SENIOR DIVISION.

Number of Stipendiary Students, 8.

No.	Names.	Caste.	Age.	From	Date of Joining the Division.	Date of Leaving the College.	Situation.	Remarks.
1	Sahib Sahoy, ..	Kayuth, ..	20	Transferred from Junior Division.	1st Sept., 1850.			
2	Seeunder Ali, ..	Syud, ..	19	Dehlie College, ..	10th ditto, 1850, ..	20th January, 1850.		Withdrawn.
3	Babur Ali, ...	Syud, ..	19	Ditto ditto, ...	10th ditto, 1850, ..	8th November, 1850.		Ditto.
4	Kadar Nath, ..	Bunya, ..	20	Ditto ditto, ...	10th ditto, 1850.			
5	Abdool Hufeez, ..	Sheikh, ..	17	Ditto ditto, ...	19th ditto, 1850.			
6	Balmookund, ..	Brahmin, ..	21¼	Ditto ditto, ...	19th January 1850.			
7	Mohun Lall, ..	Bunya, ..	20	Ditto ditto, ...	Ditto ditto.			

THIRD DEPARTMENT, JUNIOR DIVISION.

	Names.	Caste.	Age.	From	Date of Joining the College.	Date of Promotion to Senior Division.	Date of Leaving the College.	Situation.	Salary.	Remarks.
8	Nusseer Oollah, ...	Sheikh, ...	17	Delhi College, ..	May 16th, 1848,	.. ..	Jany. 18th, 1850,	Native Surveyor 5th Dn. G. C. Etawah, ...	15	
11	Kunhya Lall, ...	Bannya, ...	15	Ditto ditto, ..	May 9th, 1849, ..	.. ..	July 17th, do.	N. S. under Civil Engr. Punjab Inundation Canals, Mooltan, ...	25	
16	Jey Dyal, ...	Ditto, ...	15	Ditto ditto, ..	May 9th, do. ..	.. ..	Dec. 24th, do	N. S. under Civil Engr. Punjab, ...	0	
17	Myboob Ali, ...	Syud, ...	2	Ditto ditto, ..	May 9th do. ..	.. ..	June 1st, do.	.. .. ..	0	Struck off at his own request receiving Certificate.
18	Moulah Buksh, ...	Sheikh, ...	22	Mungloar, ...	June 1st, do. ..	.. ..	Sept. 3rd, do.	N. S 5th Dn. G. C. Etawah, ...	15	
19	Lootf Oollah Khan,	Pathan, ...	24	Roorkee.	June 5th, do...	.. ..	Nov. 18th, do.	Draftsman, Office of Superintendent of Canals,	20	
21	Dildar Ali, ...	Syud, ...	19	Delhi College, ..	Sept. 26th, do...	.. ..	July 17th, do.	N. S. under C. E. Punjab, inundation Canals, Mooltan, ...	25	
22	Peearee Lall, ...	Kayoth, ...	18	Bareilly School,	Oct 1st, do. ..	. ..	Sept. 7th, do.	. .. ..	0	Withdrawn.
23	Shib Sahai, ...	Ditto, ...	19	Ditto ditto, ..	Oct. 1st, do. .	Sept, 1st, 1850, ..	.. . ..	.. .. ..	0	
24	Mashook Ali, ...	Sheikh, ...	16	Ditto ditto, ..	Oct. 2nd, do.	. ..	Sept. 30th, do.	N. S. under C. E. of Punjab.	25	Died at Rawul Pindee Nov. 1850.

THIRD DEPARTMENT, JUNIOR DIVISION—(Continued).

	Names.	Caste.	Age.	From	Date of Joining the College.	Date of Promotion to Senior Division.	Date of Leaving the College.	Situation.	Salary.	Remarks.
25	Abdoor Ruhman, (1,)	Ditto, ...	18	Ditto ditto, ..	Oct 22nd, 1849,	.. ..	April 30th, 1850,	.. .. ..	0	Withdrawn.
26	Abdoor Ruhman, (2,)	Moghul, ...	19	Dehli ditto, ..	Nov. 21st, do.	.. ..	July 17th, do.,	N. S. under C. E. of Punjab, ...	0	
27	Museh Oollah, (2,)	Sheikh, ...	19	Ditto ditto, ..	Nov. 21st, do.	.. ..	.. ..	.. .. ..	0	
28	Qoodrat Oollah, ...	Ditto, ...	20	Meerut, ...	Dec 17th, do.	.. ..	Dec. 24th, do.,	N. S. under C. E. of Punjab, ...	25	
29	Nathoo Singh, ...	Rajpoot, ...	17	Roorkee, ...	December.					
30	Nuzzur Hursaiy, .	Syud.	18	Munglour, ...	Feby. 13th, 1850.					
31	Mohammud Ismail,	Sheikh, ...	18	Dehli College, ..	Mar. 11th, do.					
32	Fyzzool Hursun, (2,)	Ditto, ...	17	Ditto ditto, ..	June 17th, do.					
33	Gunesh Lall, ...	Kayuth, ...	18	Saharunpoor, ..	July 18th, do.					
34	Elahee Buksh, ...	Rajpoot Moslmn.	19	Deobund, ...	July 20th, do.					
35	Kurreem Oollah, ..	Sheikh, ...	22	Dehli College, ..	Aug. 27th, do.					
36	Golam Hyder, ...	Ditto, ...	22	Ditto ditto, ..	Sept. 3rd, do.					
37	Moonna Lall, ...	Vishnow Bunya,	17	Mooradabad, ...	Ditto ditto.					
38	Fyzool Hursun, (3,)	Sheikh, ...	16	Munglour, ...	Sept. 12th, do.					
39	Kasim Ali, ...	Ditto, ...	18	Dehli College, ..	Sept. 12th, do.					
40	Abdoor Ruhman (3),	Moghul, ...	20	Dehli College, ..	Dec. 13th, 1851.					
41	Abdoollah, ...	Sheikh, ...	19	Deobund, ...	Dec. 5th, do.					
42	Ahsan Oollah, ...	Ditto ditto, ..	17	Meerut, ...	Dec. 25th, do.					
43	Sheikh Ahmud, ...	Ditto ditto, ..	19	Dehli, ...	Dec. 24th, do.					

Non-Stipendiary Students, Year 1850.

No.	Names.	Date of Entering the College.	Date of Leaving.	Remarks.
	ATTACHED TO 2ND DEPARTMENT.			
1	J. Todd, ...	January 14th, 1850.		
2	F. Platts, ...	Ditto 21st, 1850. ..... September 26th, 1850.	..	Left the College and rejoined on the second date specified.
3	J. Wharton, ...	March 13th, 1850.		
4	A. Cawood, ...	September 23rd 1850.		
	NON-RESIDENT CLASS.			
1	C. F. Scott, ...	December 17th, 1849. .... October 8th, 1850.	..	Ditto ditto ditto.
2	C. Anderson, ...	October 23rd 1850.		

The following is the substance of the Report furnished by Lieutenant Maclagan of the operations of this College during 1850.

Several new arrangements were made during the past year, among which may be noticed the introduction of a new class of the students constituting the Senior Division of the 3rd Department, as notified in the revised prospectus published in Orders of Government, dated 13th August. Another, was the increase in the prescribed number of students in the 2nd and 3rd Departments, and the extension of their period of study. Another, was the provision of drawing instruments and suitable class books for each student, and the appointment of fixed dates for the admission of students of each Department.

The first of these arrangements was rendered necessary by the increased demand from different branches of the Public Service for qualified laborers, and partly by a contemplated alteration calculated still further to diminish the already insufficient annual supply. The second, was an important alteration providing more sufficient means for carrying out, particularly in the 2nd Department, such a course of instruction as appeared desirable, and affording opportunity to the more able and industrious students of advancing to higher Mathematical attainments, which might hereafter be turned to good account.

As respects the admission of students at fixed dates, this plan enabled them to pursue their studies simultaneously instead of as before independently, an arrangement equally advantageous to the student and the teacher. By this plan, too, the inconvenience to which the men of the 2nd Department were subjected by having to march from distant stations at unfavorable seasons of the year was obviated ; they will now be able, whether joining the College or leaving it for employment, to travel only during the cold weather.

The plan for fixed dates of admission was more difficult of immediate adoption in the 3rd or Native Department, the continued demand for Surveyors, Levellers, Draftsmen, &c., &c., rendering it necessary both to send off the more advanced as soon as they were fit, and to supply their places immediately from among the expectant candidates. The Principal however intended to introduce the plan in the course of 1851.

The number of students of all Departments who were drafted off during the past year for the Public Service was nineteen, being ten Europeans and nine Natives. The total number who had received instruction at the College during the same period was 57.

FIRST DEPARTMENT.

The first student of this Department who left the College was the third on the roll prefixed to this notice, *i. e.*, Mr. J. F. Platts, who, on an application from the Surveyor General for a European student possessing certain qualifications, was examined, pronounced qualified, and appointed Extra Sub-Assistant on the Grand Trigonometrical Survey. He is now employed in the Survey operations in the Punjab. The senior student of this Department was recommended in December 1850 for the situation of Sub-Assistant Engineer in the 5th Division. He was examined by a Committee, and pronounced qualified, but joined his appointment in 1851.

The want of class-books had, to a certain extent prevented the proposed course of study being followed out, but there were important parts of both field and class-room instruction independent of the aid of books, and the students of this Department had, besides their regular studies, had opportunities of turning their acquirements to account, and of rendering some aid towards the execution of works in the neighborhood. These exercises are to be looked upon as particularly valuable, possessing in themselves a higher interest and conveying, in many respects, better instruction than could be afforded by any fictitious examples of the same description of work.

The Principal complained of the number of students in this Department being too small to allow of any opinion being expressed as to its working. He said there had been several applicants for admission during the past year, and that one or two promising candidates were in the field, but he thought some time would elapse before the College had a full first Department.

In his opinion, it did not appear expedient to relax the terms of admission prescribed for the achievement of this object, but there could be no doubt of the great benefit to be derived from increase of numbers and the *impetus* thereby afforded to individual exertion, and of the mutual advantages conferred by intercourse of minds of different classes trained under different systems, brought to bear, at Roorkee, upon the same subjects, and to engage in the same pursuits. On this part of the Report, the Lieutenant Governor observed that there was no reason to feel regret at the paucity of students in this Department, and thought it would be unwise at present to lower the standard of qualification for admission. The prizes attached to it, held out in his opinion constant incentives to exertion both in the Government Colleges and throughout the country, while the presence of a few scholars of high Mathematical attainments gave a tone to the studies of the Institution.

SECOND DEPARTMENT.

The new arrangement by which students of this Department, fit for employment, were allowed to join their appointments whenever they were nominated, but by which, on the other hand, passed candidates for admission could not be admitted till the 15th January, 1851, to supply the places of those that left, operated to diminish the number of students in this Department to a considerable degree, there being but five left upon the rolls at the end of 1850, of whom four were about to enter the Department of Public Works.

This almost complete clearance of the second Department during 1850, was attributed by Lieutenant Maclagan, not so much to the arrangement just noticed, as to the rapid and urgent applications received from every side for the services of Assistant Overseers, and to the circumstance of the Military Board having authorized the immediate transfer of these men to the situations to which they were called, in anticipation of the Orders of Government, and in some instances, before they had completed their prescribed term of study at the College.

In noticing the proficiency of this Department, Lieutenant Maclagan expressed himself much pleased with the progress of those who had remained their full time, and spoke in high terms of the success of one or two in plan-drawing.

In the Report of last year, Colonel Cautley, the Visitor of the College, drew attention to the advantage derivable by the students of this Department from a knowledge of Hindoostanee, and the deficiency in this respect of the Assistant Overseers, former students of the College, who, being attached to the Canal Department, came more immediately under his notice. Lieutenant Maclagan never neglected this branch of instruction, and if the defect continued in spite of his efforts, the reason was to be looked for in the limited time which the students had to devote to a study new and unfamiliar to them. Lieutenant Maclagan expected better results since their term of continuance at the College had been increased. With a view to the easier communication of instruction in Hindoostanee, Lieutenant Maclagan had entered on the preparation of several elementary books by means of which scientific terms and expressions could be learnt with facility. The Lieutenant Governor noticed these efforts in terms of great commendation.

In respect to the numbers of the Second Department, Lieutenant Maclagan observed that although it had been increased from ten to fifteen, yet that owing to the recent arrangement by which their term of study was extended from eight months to twelve, the annual supply of Assistant Overseers would remain the same. The Lieutenant

Governor felt the justice of the remark, and proposed to the Military Board to increase the number of the Department still further to thirty. This increase has since been carried into effect, but the measure will more properly come under notice in the next Report.

THIRD DEPARTMENT, SENIOR DIVISION.

This new class had been very recently formed. It was nominally set on foot in September, 1850, but did not enter on the regular course of study till the commencement of 1851. There had been candidates for admission beyond the prescribed number, but owing to various causes the class was left incomplete at the end of last year. It was said that the amount of stipend, Rs. 10 per mensem, being equal in most cases to the scholarship allowances derived from the institution at which they were educated, did not offer sufficient inducement to the students of this class, but Lieut. Maclagan rightly observed that it was not the present provision, but the future position for which they were being prepared, which should operate as the inducement, and he thought that if left to itself the class would begin to appreciate its own value, as soon as one or more of them should find employment. In the qualifications required for admission, and the general intelligence of those who had attained the requisite proficiency, the class possessed, in Lieutenant Maclagan's opinion, satisfactory materials for the production of a very useful class of public servants.

THIRD DEPARTMENT, JUNIOR DIVISION.

This Department was uniformly full, but the requisitions for native surveyors and levellers continued to exceed the means available for compliance with them. The earlier students of the Department were drawn almost exclusively from the Government Colleges. The success of some who joined the Roorkee College direct from Village Schools, *i. e.* without having had the benefit of other than home instruct on, had been followed by numerous applications from others similarly situated, several of whom, it will be seen from the rolls prefixed to this notice, had obtained admission. The impression the College has thus begun to produce to a small extent in the village instruction of the neighborhood, will be greatly furthered by the system of school inspection recently introduced into the Roorkee District. The prospect of admission to the College, and of subsequent employment, had given a stimulus to both teachers and pupils of such schools, and they were expected soon to furnish an unfailing supply of Third Department students to the College. It was found that persons of this class, though bringing with them less high attainments than those educated at the Government Colleges—in fact, only possessing sufficient proficiency to meet the minimum prescribed for admission—were nevertheless able to fit themselves within the same time that the others did, as their instruction proceeded simultaneously with their field practice.

These were not reckoned equally valuable assistants with those who had previously reached and continued to maintain a higher mathematical proficiency; but yet it was considered very desirable to encourage the efforts of those coming from Village Schools whom the low test prescribed for admission admitted of being trained for the work of Surveyors and Graftsmen. On this part of the Report, the Lieutenant Governor observed that the efforts which Lieutenant Maclagan had made in the promotion of village education, deserved the highest commendation, and that, as already observed, whatever improvement was made in these schools, would act markedly upon the College by furnishing well qualified candidates for admission. Nor was it necessary, in his opinion, to raise the character of the Department, (as hinted by Lieutenant Maclagan) to raise the standard of qualifications for admission.

Examinations of candidates took place weekly, and it was observed that in some instances, passed candidates for whom there was no immediately available vacancy, entered as stipendiary students with the view of making some advance even before being enrolled in the Department.

EUROPEAN NON-STIPENDIARY STUDENTS.

This class of students had received no great accession to its numbers since the date of last Report, but there was a prospect of its being considerably augmented during 1851. The want of places of residence at Roorkee had been found a great draw-back, and consequently authority was given for the erection of some bungalows for the purpose of supplying this defect. These were in progress, and would soon be completed. They were three in number, each designed to accommodate two students; but a further number will probably be required. Two of the students are preparing themselves for admission into the first Department.

In concluding his Report with some observations on the benefits to be derived during the present year from the recently sanctioned arrangements above alluded to, Lieutenant Maclagan merely added that the labors of the Masters and the general conduct of the students had been in all respects satisfactory.

On the 27th April, 1850, Lieutenant Maclagan communicated to Government a few propositions, relating to matters referred to in the Report of last year.

In the course of this year, the number of students in the Third Department, consisting of Natives was increased from 16 to 24, and the stipends of eight of the number were increased from 5 to 10 Rupees. A few stipends of both classes were to be held available for students from the Punjab, if such should apply.

The following revised notification embodying the latest changes in the constitution of the College was drawn up by the Principal, and published in the *Government Gazette* dated 13th August, 1850. His Excellency the Commander-in-Chief was pleased to republish paragraphs 5, 6, 7, and 8, in General Orders, under date the 9th September, 1850, for the information of the Army.

NOTIFICATION.

The following prospectus of the College for Civil Engineers at Roorkee is published with the sanction of the Hon'ble the Lieutenant Governor North Western Provinces, in supercession of the Notification by Government, dated 25th November, 1847.

1st. There are three Departments in the College, and in each Department, a certain number of stipendiary students, for whom quarters are provided.

2nd. First Department.—Candidates for admission to the first Department must be under the age of twenty-two. They must be well acquainted with the English language, able to read and write it with ease and accuracy, and are required to pass an examination in Arithmetic, Algebra, Geometry, Mensuration, Plane and Spherical Trigonometry, Conic Sections and Mechanics. Passed candidates will be admitted in the months of January and July of each year.

3rd. The number of stipendiary students in this Department is limited to eight. They will receive, while attached to the College, an allowance of Rs. 40 per mensem, and free quarters. Scholars from any of the Government Colleges qualified may be transferred to this Department, receiving travelling allowance to Roorkee at the established rate; and, while there, will receive an increase of one-fourth to their scholarship allowance, or such increase as will make up their stipend to the amount of not less than Rs. 40 per mensem.

4th. Their instruction at the College is designed to qualify them for the appointment of Sub-Assistant Civil Engineer, as constituted by the orders of Government North Western Provinces, dated 9th October, 1845, and generally for employment in connection with Engineering Works, and other Departments of scientific labor. Their qualifications for employment will be determined by their success in the treatment of the several subjects brought before them, and by a full examination on the completion of their course of study.

5th. Second Department.—European Non-Commissioned Officers and Soldiers. They are required, previous to admission, to prove by examination, their proficiency in reading, writing and Arithmetic as far as Vulgar Fractions, Elementary Geometry, Mensuration and

Simple Plan Drawing, and none are admissible without a satisfactory certificate of character. Passed candidates will be nominated about the month of October of each year, and will join the College in the month of January following.

6th. When not furnished with carriage at the public expense, they will receive travelling allowance to Roorkee at the rate chargeable for one camel or one two-bullock-hackery per man travelling ten miles per diem, and six days per week; a double allowance being granted to married men.

7th. They will be on probation at the College for six months, during which time they will receive their Regimental pay and allowances, and the same advantages as with their corps or the established equivalent in money. If approved at the end of this period, they will then receive the staff allowance of an Assistant Overseer in the Department of Public Works, and remain under instruction at the College, till the close of the annual term in the month of December, when, if their conduct continues to be satisfactory, they will be drafted off to their appointed duties according to the requirements of the Public Service; during the time they remain at Roorkee, they will be under the command of the Officer who fills the post of Principal of the College.

8th. The number of students in this Department has been raised to fifteen.

9th. THIRD DEPARTMENT.—Native students in number twenty-four, to whom instruction is conveyed through the medium of their own language. Admissions will take place twice yearly in the months of January and July.

10th. In this Department will be two Divisions.

11th. *Senior Division.*—To consist of eight students who must have acquired, previous to admission, a good knowledge of Arithmetic, Geometry to the extent of six Books of Euclid, Mensuration, Algebra to Quadratic Equations, use of Logarithms and the Elements of Plane Trigonometry. These will receive, whilst attached to the College, an allowance of Rs. 10 per mensem and free quarters.

12th. *Junior Division.*—The lowest attainments qualifying for admission to the Junior Division will be, as heretofore, a fair acquaintance with Arithmetic, as far as Vulgar and Decimal Fractions, and an ability to read and write Urdoo in the Persian character correctly and clearly. The number of stipendiary students in this Division is sixteen, who receive a monthly allowance of Rs. 5 and free quarters.

13th. Any student of this Division may, being found qualified, be transferred to the Senior Division; provided the prescribed number of the latter be not thereby exceeded.

14th. The practical instruction of students of this Department in both divisions is regulated with a view to their employment as Surveyors, Draftsmen, Assistants in Public Works, &c., according to their several abilities.

15th. Properly qualified candidates coming to Roorkee and supporting themselves there at their own cost, are admissible to all the Departments, so far as means may be available for their instruction. Should the number of such applicants hereafter become numerous, moderate fees will be demanded for admission to the benefits of the Institution. Instruction will continue for the present to be gratuitous, and no payments will be demanded without previous notice of one year.

16th. A limited number of European students of this class can be provided with apartments at Roorkee for the use of which a moderate monthly rent will be charged. Particulars can be learned by application to the Principal.

17th. Annual examinations will be held in the month of December, when the students will be classed according to their proficiency, and prizes will be awarded to the most successful.

(Signed) J. THORNTON,
Secy. to the Govt., N. W. P.

It having been proposed to transfer the Simla Magnetic Observatory Printing Establishment to the Roorkee College, Colonel J. T. Boileau recommended that the building to be erected at Roorkee should be capacious enough to receive both the Lithographic and Typographic Establishments, and afford quarters besides to the Printer and a few Compositors. The erection of this building, together with the transfer of the Press, were sanctioned by the Government of India on His Honor's recommendation.

Lieutenant Maclagan was informed that the building was to be constructed on a liberal scale, so that there should be conveniences for Printing and Lithographing both in English and Vernacular; the establishment was expected to execute Maps and designs from Stone, and if possible from Wood and Copper.

In his letter of the 10th February, Lieutenant Maclagan reported that he and Lieutenant Goodwyn were perfectly satisfied with the

manner in which Ameer Khan, who had applied to be a Sub-Assistant Executive Engineer, had acquitted himself at the examination which they and Mr. Middleton were requested to hold. Ameer Khan was therefore permitted to join his appointment under Lieutenant Whiting, Executive Engineer 5th Division.

The following publications were reported to have issued from the press or to be in course of publication. A translation of Hughes' Principles of Geography in Urdoo by Munnoo Lall, the 1st Native Teacher of the Roorkee College, was printed for the use of the students, &c., and an Urdoo translation of "Elliot's Practical Geometry and Mensuration" was prepared by Beharee Lall, the 2nd Native Teacher, and was being taken through the Press at Dehlie. A pamphlet on Blasting by Galvanism under water by Mr. Tresham, of the Benares College, was in the Press, and was being translated into Urdoo by Kunhya Lall, a student of the 1st Department of the College. Two other pamphlets prepared by Lieutenant Maclagan, styled "Papers prepared for the Civil Engineering College" the first on Materials, and the second on the Strength of Materials were published. The 1st Native Teacher, Munnoo Lall, was reported to have been engaged in the translation of the above "Papers" as well as of Abbott's Treatise on Bridges, and Cautley on Well Foundations.

BAREILLY SCHOOL.

14TH YEAR.

List of Members of the Local Committee Bareilly as on the 30th April, 1851.

NAMES.	DESIGNATION.
H. Pidcock, Esq., ...	Commissioner.
S. Fraser, Esq., ...	Judge.
F. Williams, Esq., ...	Collector.
E. Wylly, Esq., ...	Joint Magistrate.
Major Showers, ...	72nd Regiment N. I.
H. S. Reid, Esq., ...	Visitor General of Schools.
Captain Jones, ...	Superintendent of Embankments.
Dr. K. Kirk, ...	Civil Surgeon.
H. Berkely, Esq.	

Establishment of the Bareilly School on the 30th April, 1851.

NAMES.	DESIGNATION.	SALARY.		
Vincent Tregear, Esq.	Superintendent, ...	500	0	0
Mr. H. Templeton, ...	Head Master, ...	250	0	0
Mr. C. Gill, ...	Officiating 2nd ditto, ...	150	0	0
Luchmun Pershad, ...	3rd ditto, ...	100	0	0
Vacant, ...	4th, ditto, ...	50	0	0
Zoolfikar Ali, ...	Persian Teacher, ...	50	0	0
Kootub Shah, ...	2nd ditto, ...	20	0	0
Juwad Ali, ...	Vernacular Teacher, ...	40	0	0
Jeesookh Roy, ...	2nd ditto, ...	20	0	0
Ishri Pershad, ...	Librarian, ...	10	0	0
Amount sanctioned for Scholarships 132, deduct one at Rs. five, ... 5	.... ..	127	0	0
	Peon, ...	4	0	0
	Duftree, ...	4	0	0
	Assistant ditto, ...	4	0	0
	Durban, ...	4	0	0
	Bearer, ...	4	0	0
	Sweeper, ...	4	0	0
	Total, ...	1341	0	0

Local Receipts and Disbursements of the Bareilly School, from 30th April, 1850, to 30th April, 1851.

Resources of Income.							Actual Charges during the year.		
Separate Fund.	*Assignment from Parliamentary Grant.*	*Total.*	*Assignment from Additional Grant.*	*Establishment fixed by Government.*	*Tuition and Admission Fees.*	*Grand total of Receipts.*	Nature of Charges.	*Items.*	
							English Teachers, ...	13435 11 5	
							Oriental ditto, ...	1560 0 0	
							Scholarships, ...	1133 0 0	
							Servants, ...	288 0 0	
				Rs. A.P.	Rs. A. P.	Rs. A. P.	Librarian, ...	120 0 0	
				17451 0 0	758 15 0	18209 15 0	Fixed Contingencies, ...	140 14 0	
							Contingencies, ...	0 0 0	
							* Prizes, ...	196 0 0	
							Total Rupees, ...	.. .. ..	14873 9 5

* This includes Rs. 100 given by J. Lean, Esq., C. S.

Statement of the Number, Caste, &c., of Students at the Bareilly School, on the 30th April, 1851.

Statement showing number of paying Students and the amount paid by them; also Students who do not pay.				*Statement showing the number of Students studying each of the languages taught.*			*Castes of Students.*		
Non-paying.	Paying, and amount realized during the year.	Amount of entrance Fee realized.	Total.	English and Urdoo.	Persian.	Hindi.	Christians.	Hindoos.	Musulmans.
	272 Rs. As. P. 679 15 0	Rs. As. P. 79 0 0	Rs. A. P. 758 15 (	193	52	17	7	205	60

The School commenced the year 1850, with 196 students, and closed with 267. There had been 111 admissions during the year, while 40 had withdrawn during the same period.

The amount of admission and tuition fees received during the year had been Rs. 755, while the amount of fines levied was found to be Rs. 16-11-0 the smallness of which sum is a fair evidence of the good discipline maintained in the School.

The examination was held as usual in December, 1850. Two sets of examination questions were set by Government, one on the Histories of England, Rome and India, the other on Mathematics. The answers to the former were examined by Major Showers, a member of the Local Committee, who allotted to the best four pupils, the numbers noted in the margin,* and made the following remarks, "Doorgapershad is as yet I think the only boy entitled to a scholarship. The others show generally the want of a familiar knowledge of English: with such a defect the exercise cannot be efficiently performed." The mathematical answers were examined by the Superintendent of the School, who expressed himself a little disappointed at the Senior Students not having generally answered more of the questions correctly, as from the circumstance that most of the questions had been solved by *one or other*, it was evident that the paper was a very fair one.

* *Full No.* 300.

Doorgapershad	191
Uzmutoollah.....	132
Shib Shaye	114
Rampershad	94

Those deserving of special notice stood thus:—

1st. Doorgapershad.
2nd. Rampershad.
3rd. Uzmutoollah.
4th. Ali Ahmud.

The oral examination was conducted by Mr. Fraser and Major Showers. With respect to the portion of Gibbon's Rome which had been read by the pupils, Mr. Fraser expressed himself well satisfied with the attainments of Doorgapershad and Uzmutoollah and spoke in high terms of the improved pronunciation of the entire class. In respect to Astronomy, Major Showers reported that Doorgapershad and Uzmut-oollah answered all the questions put to them with readiness, evincing clear perception of main principles.

SECOND CLASS.

The whole of the examination of this class was conducted by Major Showers. In Reading and Explanation, the class was very defective, with the exception of the first two boys. "The answers were generally in the words of the book; it would be better if they gave them in their

own words." In Arithmetic the class passed an excellent examination. Of Geography their knowledge seemed to be very limited. They answered the questions taken from the book tolerably well, but got confused when questions which they had not seen before were proposed. In respect to Grammar, the examiner remarks "the proficiency of the boys in Grammar, as far as they have learnt, was very satisfactory, the parsing generally was very good ; as far as writing was concerned, the performance of Mena Ram and Thakoor Dass were excellent specimens. The Geometry and Algebra of this Class will be spoken of hereafter.

THIRD CLASS.

The examination of this class had been entrusted to Dr. Kirke, the Civil Surgeon. In respect to Reading it was reported that " they read very well, and a marked improvement had been manifested in English accentuation." As to Arithmetic "they showed much sharpness in working sums." Their knowledge of Geography was reported to have been very fair, and as far as Geometry was concerned, they were masters of the 1st Book of Euclid.

Mr. Cargill, Principal of the Delhi College, and Mr. H. S. Reid, Visitor General of Schools, happening to visit Bareilly at the same time, the Lieutenant Governor took advantage of this circumstance to obtain from them an impartial and competent opinion on the state of the School. Mr. Cargill states in his Report, dated the 3rd February 1851.

"*First Class.*—I examined in Arithmetic, Algebra, Geometry, Plane " Trigonometry, Mechanics and English Reading, putting also a few " Historical questions arising therefrom. Their Scientific acquirements " seemed considerably superior to their literary, the former much " beyond what might be expected from what is usually denominated a " School in this country. The latter certainly not more than one would " look for. They solved some pretty stiff equations, a moderately " difficult Geometrical problem, a similar Mechanical, and what, for " boys of their standing, was a very difficult Trigonometrical problem, " in a very reasonable amount of time. The solution of the latter by " Doorga Pershad is herewith forwarded, and though there is a very " slight mistake, especially incidental to all scholars of his standing, yet " I do not believe there is a single student of our College, who could " put off his hands such a creditable performance in the same time. " It may seem extraordinary, did I say that they were less acquainted " with the principles of Mechanics than with the principles of any " other scientific subject they had studied; such however appeared to " me to be the case.

"*Second Class*—read and appeared to understand English " well. They answered very well in Arithmetic and Algebra as far as

" Simple Equations and Geometry. I have no doubt that this, with the " exception of a few boys, will hereafter turn out an excellent first class."

After noticing similarly the third and fourth classes, Mr. Cargill concludes:

" On the whole, I should pronounce the Bareilly School, com- " pared with Schools in general, to be flourishing. At present it " treads close on the heels of some of our Colleges, and promises well " for the future. The sixth and seventh classes contain, if I remember " aright, nearly one hundred boys, who almost without exception, are " very young, and cannot fail with ordinary care and training to do " credit in time to the Institution. Perhaps too little attention has " been paid to English Literature. Hume and Gibbon should not, " to the exclusion of all other standard English Authors, be put " into the hands of the students of this country. Yet such was " the case in the Bareilly School last year. However, this will be " remedied, if, as has been proposed by the Superintendent Mr. " Tregear, they follow as closely as possible the course of the Dehli " College for 1851; such a union of studies will afford us the means " of direct comparison, and I think the Bareilly students will prove " themselves no unequal antagonists."

The following is an extract from Mr. Reid's report:

" In January last, I accompanied Mr. Cargill in his visit to the " school, and was agreeably disappointed by the correct pronuncia- " tion and attainments of the English scholars. I say 'agreeably " disappointed,' for I did not expect to find the Bareilly School on a " par with the Government Colleges, among which, I am now of " opinion, it should be ranked. The fifth class acquitted itself very " creditably (this is the lowest class) as did all the others. Their " translation into Urdoo of what they read in English, was too literal, " but this strict adherence to the words, to the neglect of the sense, " is purposely adopted, to give the boys a large stock of words.

" Mr. Cargill notices with great commendation the scientific " acquirements of the students. This part of their education is that " best learnt at School. Their literary acquirements must in a " measure be the fruit of their own reading at home. The Superin- " tendent and the Masters have not the leisure to carry them through " a wide range of English Literature. All that they can effect in this " is to direct their reading in a right course. To remedy the back- " wardness of the students in this point, candidates for scholarships " might be put on subjects embracing a wider range of collateral " reading. Major Showers' observation regarding the greater facility " with which ideas are acquired in the Vernacular, is most true. The " mind more readily grasps the subject explained in a language with

" which the mind is familiar. Nor do we observe in the Vernacular " classes, as we do in the English, so many a *hiatus valde deflendus.* " The senior scholar is generally *facile princeps*, the second *longo sed* " *proximo intervallo*, and the rest nowhere. In 1848-49, the dis- " bursements on account of the Bareilly School amounted to Rs. " 19,452-12-6, and the attendance was 219 (*vide* General Report on " Public Instruction, North Western Provinces, for 1848-49); each " scholar thus costs the State Rs. 88-13-5 per annum, or supposing " his stay in the College to be eight years, Rs. 711-5-4. For what end " is this great expenditure incurred? Not for the education of the " student as an individual merely, but for his education and fitting up " as a pioneer of Education among his countrymen."

PERSIAN CLASSES.

With the progress of the Persian classes, the Superintendent continued to be very well satisfied. The first class had during the year attained fair proficiency in the elements of Trigonometry, and had improved greatly in other branches of Science. No paper in Oriental Literature had been sent by Government, and consequently at the latter part of the examination, papers were drawn up by the Moulvies of the School, containing questions from the books read. The students who most distinguished themselves were :—

In Science.	In Literature.
Jumeel-ood-deen.	Fukhr-ood-deen.
Agha Ali.	Agha Ali.
Sahib Rae.	Ruheemoollah.
Mohomed Hoosein.	Mohomed Hoosein.
Gopal Pershad.	Jumeel-ood-deen.
Moorli Dhur.	Sahib Rae.
Fukhr-ood-deen.	Moorli Dhur.

SCHOLARSHIPS.

The total amount of Scholarships for which the sanction of Government was received, tenable during 1851, was Rs. 140, distributed as follows :—

1st English Class.	Doorga Pershad,	20	
	Uzmut Oollah,	10	
	Ram Pershad,	10	
	Bholanath,	5	
		—	45
2nd English Class.	Soonder Lall, 1st,	6	
	Sunt Lall,	6	
	Chumput Rai,	5	
	Soondur Lall, 2nd,	4	
	Salig Ram,	4	
		—	25

1st Persian Class.	Jumeel-ood-deen,	15	
	Agha Ali,	10	
	Sahib Rae,	8	
	Mohomed Hoosein,	8	
	Gopal Pershad,	8	
	Fuhkr-ood-deen,	8	
		—	57
2nd Persian Class.	Pershad,	5	
	Mehndee Ali,	4	
	Mahomed Hoosein,	4	
		—	13
	Total Rupees,		140

From a Statement appended to the Superintendent's Report, and intended to show the gradual improvement of the School, year after year, since 1848, it appeared that.

Year.	No. of Commencement.	No. of Admissions.	Left.	No. at end.	Admission and Tuition fees.
1848,	296	55	141	210	593 10 0
1849,	210	62	76	196	642 15 0
1850,	196	111	40	267	755 0 0

So that, putting out of consideration the changes which take place during each year, the number of pupils found at the close of 1848, as compared with that found at the close of 1850 on the rolls, had risen from 210 to 267, and the amount of admission and tuition fees from Rs. 593-10 to Rs. 755, thereby evincing the successful results attending the introduction of the pay system which was first put into operation in 1848, and which, in the commencement, gave rise to many misgivings as to the effect it was likely to produce. From the following course of studies, laid down by the Superintendent for the senior class for 1851, it will be seen that great efforts are being made to raise the studies of the School, as far as practicable, to the standard of the Dehlie College.

COURSE OF STUDIES PROPOSED FOR 1851.

First Class.—History of England, Hume, to the Restoration; History of Rome, Gibbon, to the reign of Justinian; Paley's Natural Theology,

the whole ; Cowper's Poems, Selections ; Political Economy, Clift's, the whole ; Additional Reading, History of India; Calculus, according to Ritchie and Hall; Astronomy, Herschell's ; Trigonometry, Hind's ; Natural Philosophy, Hutton's ; Translation and Composition.

The Superintendent recorded his entire satisfaction with the manner in which the Masters and Teachers had performed their duties. The Head Moulvee, Zoolfiqar Ali, and the Teacher of the sixth class, Jee Sookh Rae, merited special commendation.

Independently of the scholarships, prizes were awarded to the most deserving students in each Department.

In concluding his Report, the Superintendent reminded the Committee that, on his former visit to the School (in 1848), the Lieutenant Governor had been pleased to express his intention of placing it on a higher footing, whenever the change should be warranted by the progress of the Institution. The Superintendent himself felt reluctant to offer any opinion as to the degree to which the necessary conditions had been fulfilled, but he left the Committee to judge of the propriety of offering any suggestions on the subject.

The Superintendent's Reports with its enclosures accompanied by minutes from the several Members of the Local Committee, together with the one previously submitted by Mr. Cargill, afforded satisfactory evidence that the English Department of the School was in a thriving state, and that it reflected credit on the Superintendent and Teachers, who had been entrusted with the management of it. Less information was furnished than could have been wished, as regarded the attainments of the Persian and Arabic Classes in Literature and Science, as well as the advance made by all the students generally in a correct acquaintance with their own Vernacular languages.

At a later period of the year, the Bareilly School was erected into a College, and the present Superintendent, Mr. V. Tregear, was appointed Principal, as it was found that the funds at the disposal of the Government admitted of the measure.

AJMERE SCHOOL.

The Ajmere School of 1836.

A Government School was first established in this city in May, 1836, by the General Committee of Public Instruction, acting under the Government of Bengal.

The reason assigned was that Ajmere was the capital of a British province, and the central point of an enormous tract of country under British influence, destitute entirely of European instruction.

A gentleman well qualified for the post of Head Master was found on the spot in Mr. Marcus Hare. Two native teachers of Hindee and one of Urdoo were appointed. A house was fitted up for the Head Master, and a commodious School-room built for the pupil's. The European Society of Ajmere and of the neighbouring Cantonment of Nusseerabad, came forward liberally in support of the Institution by handsome donations and monthly subscriptions.

For some years, the School appeared to prosper, though the number of pupils, which stood at 219 at the end of 1837, fell off to 143 in 1840. The result of the examination, however, which was held at the close of 1842, was unsatisfactory. At that period, 171 boys appeared on the rolls, consisting of 5 Christians, 41 Mahomedans, and 125 Hindoos. But when the examination came on, only 70 pupils were found assembled in the School, and these acquitted themselves in a discreditable manner. At this time, there was only one paying student in the Institution.

The Council of Education, in their Report for the year, noticed this unfavorable result in terms of great disappointment, and expressed a doubt whether the hearty co-operation of the native gentry would ever be so obtained, as to render the continuance of the School advantageous. A further trial for six months was hereupon allowed by Government, on the expiration of which the School was abolished on the 1st January 1843.

In the following year, the charge of the Educational Department in the North Western Provinces was transferred to the Agra Government, but nothing occurred to call special attention to Ajmere till the Lieutenant Governor paid a visit to that place in the cold season of 1846-47.

The result of that visit was to impress His Honor with the desirableness of re-establishing an Educational Institution at the above place, and the Government of India were accordingly addressed on the subject.

Letter dated 3rd April, 1847, to the Government of India, proposing the re-establishment of a School at Ajmere.

It was observed in this letter that the Lieutenant Governor had been much struck, in making his tour through Rajpootana, with the desire which was manifested by many influential persons to study the English Language: that Maharaja Ram Singh of Jeypoor read English well, and took considerable interest in the study of it: that he maintained an English School at Jeypoor, and that some of the nobles of his Court engaged tutors for the instruction of their children in English: that Maharajah Kulyan Singh of Kishengurh had also engaged a tutor for the study of English, and had expressed a desire to attain a good knowledge of the language: that the British Province of Ajmere, situated in the heart of Rajpootana, should take the lead in promoting this spirit, and in affording to the surrounding states the opportunity of perfecting themselves in the language and literature of England: that although the attempt made to maintain a School in that city, on a rather expensive establishment, during past years, had not been successful, yet that in 1847 such an Institution might be revived with better chance of success, because there then existed a greater desire on the part of the Natives, than formerly, to study English and obtain a liberal education, and that, as the Local Government of Agra was then invested with the control of the Educational Establishments in the North Western Provinces, it was able to exercise a closer superintendence than could formerly be maintained from Calcutta. It was stated that the cost of maintaining a good Oriental and English School would probably be Rs. 10,000 per annum, which sum was available as part of the Education Funds allotted to the Agra Division of the Presidency. His Honor, however, conceived that the success of such an Institution would be problematical, as he had seen much reason to question the expediency of founding or maintaining mere Schools, which depended for their efficiency mainly upon the character of the residents at the station, and the countenance and support they might afford to the Institution. Colleges, on the other hand, had efficient establishments of their own; they depended for success upon their innate strength and character, and won for themselves a respect and confidence which were never accorded to less influential establishments.

It was estimated that the cost of a new College would be about Rs. 40,000 per annum, and the expense of erecting a suitable College, and attached houses for the Principal and Head Master, would be Rs. 50,000. These expenses could not be defrayed by the Education Fund,

and, therefore, unless the surplus expense above Rs. 10,000 per annum could be drawn from other sources, the project must for the time be abandoned. The Lieutenant Governor observed that it might be possible by solicitation, to obtain the required sum by contributions from the native States of Rajpootana; but that such requests came with a bad grace from a power in the commanding position of the British Government; that the sum contributed would be mainly spent in the allotment of large salaries to European Masters, and would therefore have the appearance of a device to find support for foreign functionaries at the expense of native States; that the only dignified course would be for the British Government to found a complete and really efficient establishment, and that, as the institution acquired public respect and confidence, it would be well to leave it to the native States to found in connection with it additional professorships and scholarships, as they might feel disposed.

His Honor was prepared immediately to establish a School, which was all that was then required, if he felt assured that funds would be hereafter supplied to make the School merge into a College.

The above proposition was finally referred by the Governor General for the consideration and orders of the Court of Directors, and in due time was received a copy of the Hon'ble Court's despatch enclosed in Mr. Secretary Bushby's letter of the 19th Feby. 1848, sanctioning the establishment of a School, but reserving for future consideration its extension to a College.

The state of the Education Fund at the time when this despatch was received, did not admit of the immediate commencement of operations, but in the middle of 1849 this impediment appeared to be removed. A letter was consequently addressed to Lieutenant Colonel Dixon, Superintendent of Ajmere, requesting him to consult with Colonel Low, C. B., the Agent of the Governor General in Rajpootana, and to report whether, with reference to the wishes and feelings of the people, the present was considered a suitable time for opening the School, and if so, what facilities in the way of buildings existed at Ajmere.

Lieutenant Colonel Dixon replied that the proposition had been received by the people with feelings of universal satisfaction. He mentioned, as proofs of their willingness to support an Institution of this kind, that there already existed at Ajmere 17 native Schools with 493 pupils, and that an English School had lately been established by Lalla Birdrabun, the Post Master of the station. Lieutenant Colonel Dixon proposed that the old Court House should be appropriated to the purposes of a School-house, and that separate houses should be erected for the Masters in the vicinity.

Some further difficulty was experienced in finding a suitable person to superintend the proposed Institution, but this was finally removed by the appointment of Dr. Buch, a gentleman qualified in all respects for the post. The school was accordingly organized by orders of the 25th March, 1851. Copy of the Resolution of Government bearing that date, and of the letter addressed to Colonel Low, President of the Local Committee, will be found in the Appendix (II).

On the 11th April, 1851, the Local Committee proposed to Government the addition to their number of Moulvee Mujeed-ood-deen, Senior Sudder Ameen. They further recommended that the whole building appropriated for the School be allotted purely to Educational purposes, and the Superintendent be authorized to draw Rs. 50 house-rent forthwith, and solicited the sanction of Government to an increase of Rs. 6 to Rs. 20 allotted monthly for the servant attached to the School, on the ground of the dearness of provisions at Ajmere. The two first propositions received the immediate sanction of Government. The third request was complied with some time afterwards.

From a brief sketch of the arrangements submitted by the Secretary Local Committee, under date the 1st May, 1851, it appeared that the following gentlemen then composed the Local Committee.

LOCAL COMMITTEE.

Colonel J. Low, C. B., Agent to the Govr. Genl.—*President.*
Lieut.-Colonel C. G. Dixon, Superintendent at Ajmere.
Mr. Bouverie, Assistant Resident at Ajmere.
Mr. Macaulay, Civil Assistant Surgeon at Ajmere.
Moulvee Mujeed-ood-deen Sudder Ameen of Ajmere.
} *Members.*
Dr. C. Buch, Superintendent of the School—*Secretary.*

The authorized Establishment had been thus completed.

Dr. Buch, Superintendent, -- -- --	400 0 0	
House Rent, -- -- -- -- -- --	50 0 0	
		450 0 0
Mr. G. Wiggins, 1st Master, -- -- --	150 0 0	
Personal, -- -- -- -- -- -- --	100 0 0	
		250 0 0
Sookhdeo Buksh, 2nd Master, -- --		80 0 0
Rama Chund Mookerjee, Assistant Teacher,	10 0 0	
Librarian, -- -- -- -- -- -- --	10 0 0	
		20 0 0
Moulvee Mahomed Muzhur, Professor of Persian and Urdoo, -- -- -- --		40 0 0
Moonshee Meer Ali Nuquee, 2nd Teacher of Persian and Urdoo, -- -- -- --		26 0 0
Carried over, -- Rs.		866 0 0

Brought over, Rs.				866	0	0
Pundit Deva Dutta, Professor of Sanscrit and Hindee, -- -- -- -- -- -- -- --				40	0	0
Pundit Russuk Lall, 2nd Teacher of the above subjects, -- -- -- -- -- -- -- --				26	0	0
Servants.						
2 Chuprassees at 5 rupees each, -- --	10	0	0			
1 Chowkeedar, -- -- -- -- -- --	4	0	0			
1 Furash, -- -- -- -- -- -- -- --	4	0	0			
1 Sweeper, -- -- -- -- -- -- --	3	0	0			
1 Bhistee, -- -- -- -- -- -- -- --	5	0	0			
				26	0	0
Fixed Monthly Contingencies,				12	0	0
Total Monthly Expenditure, Rs.				970	0	0

Dr. Buch stated that the Committee, though fully aware of the difficulties attending the introduction of the fee system, concurred with the Lieutenant Governor in the propriety of the demand, but they thought the entrance payment should be for a time kept in abeyance, and for the present resolved only to demand monthly fees of from four annas to one rupee per mensem.

With reference to paragraph 8 of the Resolution of the 25th March last, the Local Committee proposed the following establishment for the supervision of Village Schools.

1 Zillah Visitor for Mairwarrah, -- -- -- -- -- --				30	0	0
2 Do. for Ajmere, -- -- -- -- -- -- -- -- -- --				60	0	0
1 Persian and Hindee Sub-Teacher for Kekree, -- --				15	0	0
4 Hindee Teachers for Bhunae, -- -- --	15	0	0			
Ramsar, -- -- -- -- -- -- -- -- --	15	0	0			
Musooda, -- -- -- -- -- -- -- --	15	0	0			
Rajgurh, -- -- -- -- -- -- -- -- --	15	0	0			
				60	0	0
Total per mensem Rs. --				165	0	0
or per annum Rs. --				1980	0	0

With respect to Mairwarrah, the Committee reccommended the maintenance of the existing establishment, but wished the salary of the Persian and Urdoo Teacher at Nye Nuggur to be raised from Rs. 10 to Rs. 15 per mensem, and that of the two Government Teachers from Rs. 4 to Rs. 10. The total annual expense was estimated at Rs. 2200, including Rs. 250 for rewards. The Visitors and School Masters were to be placed under the Superintendent of the Ajmere School, who would see to the punctual performance of their duties and draw up the official Reports.

His Honor was of opinion that the establishment for the supervision of Village Schools proposed above might do well as the standard to be ultimately reached, but that at present there were not available funds to meet so large an expenditure. He approved of the transfer of the agency from the superintendence of Colonel Dixon to that of Dr. Buch, and sanctioned the entertainment of one Pergunnah Visitor for Ajmere, and one for Mairwarrah, each on a salary of Rs. 30 per mensem. The further extension of operations would depend on the information which might be collected by these Zillah Visitors, and the interest in the course of education which they might be able to excite as well as on the funds that might be found disposable.

SAUGOR SCHOOL.

15TH YEAR.

Return of the Local Committee, as on the 30th April 1851.

Saugor, 1*st May*, 1851.

NAMES.	DESIGNATION OF OFFICE.
Captain E. K. Elliot,	Deputy Commissioner, 1st Class.
Lieut. T. W. Pinkney,	Do. do., 3rd Class, and Secy. L. C. P. I.
Moulvie Syud Alli Hoossein,	Sudder Ameen.
Moulvie Muhomed Hadi Ali,	Moonsiff.
Rao Anunt Rao Bhya Sahib,	Thekadar of Jysingnugur and Honorary Member.

Establishment as on the 30th April, 1851.

NAMES.	DESIGNATION.	SALARY.	DATE OF APPOINTMENT.	REMARKS.
ENGLISH DEPT.				
James Rae,	Head Master,	300 0 0	12th June, 1837.	
W. H. Bachman,	2nd ditto,	*200 0 0	11th May, 1846.	
Khoman Singh,	Joint Librarians,	10 0 0	29th Oct., 1850.	
Juvahur Lall,			1st Jan., 1851.	
VERNACULAR DEPT.				
Hindee.				
Behareee Purohit,	1st Teacher,	25 0 0	15th March, 1842.	
Kunhyeram,	2nd ditto,	20 0 0	17th April, 1847.	
Bholye,	3rd ditto,	15 0 0	15th March, 1842.	
Duryao Singh,	4th ditto,	15 0 0	18th do., 1850.	Acting.
Girdharee Lall,	5th ditto,	15 0 0	1st January, 1851.	
Muharaj Singh,	Assistant ditto,	5 0 0	18th March, 1850,	
Kunhya Lall,	Monitor,	2 8 0	16th Nov., 1846.	
Ram Chund,	Ditto,	2 8 0	1st May, 1848.	
UADOO DEPT.				
Gholam Russool,	1st Moulvie,	25 0 0	27th Oct., 1843.	
Abdoolsalam,	2nd ditto,	50 0 0	1st March, 1847.	
Imam-ood-deen,	Persian Teacher	†8 0 0	15th May, 1815.	
Bhuwanee Purshad,	,, Monitor,	†2 8 0	16th do. 1848.	
Servants,	1st Bearer,	4 0 0	15th March, 1842.	
	2nd ditto,	3 0 0	Ditto.	
	Bhistee,	2 0 0	Ditto.	
	Peon,	3 0 0	Ditto.	

* Personal allowance, authorized allowance for 2nd Master Rs. 80 per mensem.

† Paid from Tuition Fees.

List of Scholarships in the Saugor Government School, for 1851.

	Rs.	
Junior Scholarship (1,)	8	Vacant.

Statement exhibiting the Number, Caste, &c. of the Pupils in the several Departments of the Saugor Government School, as on the 30*th April*, 1851.

English Department.			Hindee Department.			Urdoo Department.			Total.			Total of all Castes.
Christians.	Hindoos.	Moosulmans.	Christians.	Hindoos.	Moosulmans.	Christians.	Hindoos.	Moosulmans.	Christians.	Hindoos.	Moosulmans.	
12	60	3	0	85	7	0	36	15	12	181	25	218

Statement exhibiting the Number of Paying and Non-paying pupils in the several Departments of the Saugor Government School, as on the 30*th April*, 1851.

English Department.		Hindee Department.		Urdoo Department.		Persian Class.		Total.		Remarks.
Paying.	Non-paying.	Paying.	Non-paying.	Paying.	Non-paying.	Paying.	Non-paying.	Paying.	Non-paying.	
0	75	0	92	0	51	39	0	39	218	The number 39 entered as paying is included in the number 218 non-paying.

Local Receipts and Disbursements of the Saugor Government School during the Official Year 1850-51.

Receipts of Annual Income.							Actual Charges during the year.		
Separate Fund.	*Assignment from Parliamentary Grant.*	Total.	*Assignments from Additional Grant.*	*Establishment and expenditure as fixed by Government dated 23rd January, 1841.*	*Tuition Fees.*	*Grand Total of Receipts.*	*Nature of Charges.*	*Items.*	Total.
	4776	4776	2364	7140	168 11	7308 11	English Teachers, ...	6000 0 0	9022 1 0
							Librarian, ...	120 0 0	
							Vernacular Teachers, ...	1200 0 0	
							Establishment, ...	144 0 0	
							Junior Scholar, vacant, ...	0 0 0	
							Contingencies, ...	*436 1 0	
							Prizes, ...	96 0 0	
							Urdoo and Persian Teacher, ...	1026 0 0	
Establishment.	Contingencies.	Prizes.	Purchase of books.	Junior Scholarship.			Grand Total.		
8490	*436	96	0	0			9022 1 0		

*Rupees 315-6-3 were expended on repairs of the School premises.

The annual examination of the pupils of the Saugor School commenced on the 26th December, 1850, and continued till the 8th January, 1851. The usual month for the examination was October, but Captain E. K. Elliot, an active member of the Local Committee, found it impossible to withdraw his attention from the important judicial matters then under his investigation, and in his absence it was utterly impracticable to hold an examination in October, as the only remaining member of the Committee at Saugor was Lieut. Pinkney, the Secretary. Fortunately, in December, 1850, Doctor Spilsbury, the Superintending Surgeon, and Lieut. W. K. Elliot, Deputy Commissioner of Dumoh, were present at Saugor, and advantage was taken of the circumstance to obtain their assistance in conducting the examination. Doctor Spilsbury took up the Reading and Explanation of the Hindee classes. The other subjects pursued by them were taken up by Lieut. Pinkney and Lieut. Elliot. The Urdoo classes were examined by the Sudder Ameen and Moonsiff of Saugor. The English classes were examined by Lieut. W. K. Elliot and Lieut. Pinkney, with the exception of the fourth and fifth class, and a portion of the first which were taken up by Lieut. E. K. Elliot.

At the time of the examination the numbers attending the School in each Department were as follow:

In the English Department,	69
In the Hindee Department,	95
In the Urdoo Department,	39
	203
A Persian paying class,	39

The numbers attending each Department on the corresponding date last year were as follow :—

In the English Department,	49
In the Hindee Department,	104
In the Urdoo Department,	59
	212

Showing an increase of twenty in the English, a decrease of nine in the Hindee and a decrease of twenty in the Urdoo Department. The Head Master was inclined to attribute the increase of the numerical strength of the English classes to the circumstance that the pupils of the School were manifesting an increased desire to qualify themselves for the subordinate situations under Government, yielding salaries ranging between Rs. 15 and 30 per mensem, which became vacant from time to time in the Saugor Territories, and to the fact that it appeared to the pupils that a very moderate knowledge of English gave them a far better chance of obtaining a livelihood, than

a much deeper acquaintance with the Oriental languages could give them.

The Head Master expressed apprehensions as to the effect which would be produced by the introduction of the pay system, but the Hon'ble the Lieut. Governor "was well satisfied that it would be "found eventually advantageous to require a monthly payment from "all the students (at least in the English Department) and therefore "desired that a month's notice might be given (on the receipt of the "letter from which this passage is quoted) of the intention of Govern-"ment to require, after the expiration of that period, a payment of "eight annas a month from all the boys attending the English classes. "Exceptions might be made to this rule at the discretion of the "Committee, but only in favor of those boys whose parents were "manifestly too poor to pay even that small fee."

The amount of entrance fees collected during 1850 was,

From the English Department,----------	Rs.	40	0	0
From the Hindee Department,----------	,,	13	0	0
From the Urdoo Department,----------	,,	13	0	0
	Rs.	66	0	0

and the amount realized from tuition fees with the payments of the Persian Class was Rs. 171-7-9.

The studies fixed by the Committee to be gone through by the Senior English class during 1851 were as follow:—

Poetical Reader No. III. 100 pp.
McCulloch's Grammar, 70 pp.
Goldsmith's Geography, the four Quarters.
Euclid, 2 and 3, as well as 4 and 5 Books.
Algebra, to Quadratic Equations.
Mensuration, Planes and Solids.
Introduction to Astronomy.
Copying Maps, Land Surveying.
Dictation, Translation, and Composition.

It sometimes happened that some boys of the class, owing to their inferior attainments, did not go through the same subjects during the year with their fellows.

ENGLISH DEPARTMENT.

The English Department consisted of five classes.

The first class was under the charge of the Head Master, and the second more especially under the second Master Mr. Bachman, receiving occasional assistance from the Head Master. The others were

instructed conjointly by Messrs. Rae and Bachman with the aid of the head boys as monitors. Gunput, the senior boy of the School, left it in August, 1850, and is at present in the employ of Colonel Sleeman, at Lucknow, giving great satisfaction.

In the commencement of 1850, the senior class had nine pupils, but by the time the examination came on, *i. e.*, in December, the class had suffered materially. Only three boys could be selected as having made good progress during the year. These were Girdharee, Khoman Singh and Jowahir Loll. The others had made fair advancement, but much more was reasonably to be expected from them.

As Girdharee is singled out and spoken of by the examiners in terms of high commendation, the following extracts from the minutes of the examiner Lieut. Pinkney, the Secretary to the Local Committee, assisted by Lieut. E. K. Elliot, member, will not be out of place. After a few remarks on the poorness of their Geography, Lieut. Pinkney says, "in Geometry, Mensuration and Trigonometry, Girdharee is greatly "a-head of the other boys of his class, and as far as he has studied, "viz. to the first four books of Euclid, Mensuration of planes and "heights and distances, respectively, he shows a thorough knowledge "of his subject. Khooman Singh was also very good as far as he had "gone. Jowahir Lall and (save in Trigonometry), Duryao were next "in attainments to Girdharee and Khooman, but were far behind "even the latter. As however they have but lately commenced, we "must not judge severely of them. In Algebra, Girdharee could readi-"ly and off-hand work out any sum as high as quadratic equations. "Khooman Singh acquitted himself fairly as far as simple equations. "Girdharee is well acquainted with and apt in all the rules of Arith-"metic up to double fellowship; the others were far behind him both "in the extent and quality of their knowledge, but Khooman was "decidedly the next best."

It appeared from Lieutenant Elliot's minute that Dr. Spilsbury had been kind enough to make Khooman Singh a present of a set of Mathematical Instruments for his attainments in Mathematics, and for penmanship.

The examination of the 2nd class was likewise conducted by Lieutenant Pinkney, assisted by Lieutenant E. K. Elliot, who after describing the relative merits of its pupils generally, closed with the following remarks.

"On the whole, I think that this class has passed a very satisfac-"tory examination. There seems to be a greater spirit of emulation "amongst the boys comprising it than amongst those of the first class, "which is to be attributed to their being nearly of an age and on a par "as to their acquirements. Beharee, rajpoot, is decidedly the boy of

"the greatest talents and acquirements, but Chundekapershad, "Kesho Bhutt and Nawul Singh are also in every way deserving of "praise."

The Head Master felt it his duty to add that Mr. Bachman had assisted him most efficiently in every way in conducting the studies of the English classes.

URDOO DEPARTMENT.

This Department consisted of five classes, and a Persian class divided into four divisions, and as was observed before, a decrease of 20 had taken place in its numerical strength since December, 1849. This decrease was stated by the Head Master to be owing to the admission of a boy of the chumar caste and the consequent immediate secession of some 15 boys of the Pundit caste. The circumstance was alluded to by Lieutenant Pinkney in his letter to Government forwarding the Report, &c. of the School for 1850 in the following terms.

"During the last year there occurred a secession of 15 boys of the "Pundit caste in consequence of the admission of a chumar boy. The "particulars of the above are fully detailed in the note book, and it "is useless to repeat them here. As yet none of the boys so with-"drawn have been permitted by their relatives to return, but after "taking so decided a step as withdrawal, a feeling of false shame will of "course prevent the boys' parents sending them back for some time "to come; but I have little doubt that, ultimately, the people of the "Pundit caste seeing the Committee firm in its determination not to "yield to their prejudices will again send their sons to study at the "Saugor School." The course pursued by the Committee in this affair was approved by the Lieutenant Governor.

The Department was, however, stated to retain its former efficiency. The Moulvies, Gholam Russool and Abdool Salam, continued to merit the high reputation which they had already earned as Teachers.

The examiners were Mahomed Ali Hoosein, Sudder Ameen, and Mahomed Hadee Ali, Moonsiff of Saugor. Their report signed by them jointly was forwarded to Government in original. They stated that the 1st class which had begun the study of the Miftah-ool-aflak and Geography, &c., last year had passed a very satisfactory examination, and spoke in favorable terms of the lower classes, attributing the satisfactory result to the zeal and assiduity of the teachers, to whose learning and acquirements they likewise bore the highest testimony.

HINDEE DEPARTMENT.

This Department consisted of five classes each instructed by a separate gooroo. As was stated above, a decrease of nine had taken place since last year in the numerical strength of the Department.

The Head Master was inclined to believe that this might have been owing to the obligation under which the pupils were laid to purchase expensive books read in the School. A general complaint to this effect had been already made by the pupils. It was imagined that if cheap editions of such works as the History of India and the Brief Survey of History were printed, they would be readily purchased. The Head Master complained of not possessing any cheap Hindee History of England, the one published by the Dehlie Translation Society being too expensive for the limited means of the pupils, and that he was obliged to teach Algebra and Geometry by means of the Mahratta Translation of Hutton's Mechanics. The Lieutenant Governor noticed these remarks in his reply to the letter of the Secretary Local Committee, and with a view to supply the want of Hindee books complained of, communicated the remarks of the Head Master to Mr. H. S. Reid, the Inspector General of Schools, who was engaged in the compilation of several Elementary Treatises in that language. Mr. Reid was requested to place himself in communication with Lieutenant Pinkney on the subject.

The 1st Hindee class was under the charge of gooroo Beharee. This teacher was described by the Head Master as a man deeply imbued with Hindoo prejudices, but one who had acquired a good knowledge of Euclid and Algebra under the late Mr. Wilkinson of the Sehore School, and was well calculated to superintend the scientific studies of the Hindee classes.

The 2nd Hindee class was instructed by Kunhye Ram. This teacher was spoken of in the highest terms by the Head Master, both as to his zeal and attainments. He had been taking his class a good way into Chemistry, Geography, and Grammar, and the examination which it passed was highly creditable to him.

The 3rd class was instructed by Bholi, a very respectable man, and held in high estimation by the people of the city, but his class had made little progress. Bholi possessed ability, but was too old to teach, and was recommended by the Head Master to be allowed to retire on a pension. The two remaining classes deserve little notice. Lieutenant Pinkney and Lieutenant E. Elliot examined the Hindee classes in all the subjects except Reading and Explanation, which were taken up by Dr. Spilsbury, who likewise examined the 1st class, and their reports were not as satisfactory as might have been wished. In the 4th paragraph of his letter to Government, Lieutenant Pinkney remarked the

"Hindoo gooroos, however, deserve no such praise, and in consequence "of former unfavorable reports regarding this Department and its pre-"sent unsatisfactory state, the Committee have felt it incumbent on "them to show to the Hindee teachers that carelessness and inefficiency "in the performance of their duties will in no way be tolerated. Of "the two most negligent, one has been dismissed, and the other remov-"ed to a lower class on less pay; all have been reprimanded. In the "place of the man dismissed, Girdharee, the senior boy of the 1st class "has been appointed fifth gooroo."

His Honor hoped that these decisive measures would have a good effect on the Hindee classes, but observed, that it seemed probable from the dissatisfaction which had been expressed with the teachers in that Department for several years past, nothing but an entire change of instruction and the "substitution of other and more active men would place the Department on a satisfactory footing."

The Head Master having proposed, with a view to effect a radical reform in the Hindee Department, the plan of causing one gooroo to report on the progress of all the classes in Mathematics, and another to report on their progress in Geography, the Committee did not quite acquiesce in the proposition, as such a system (in their opinion) would inevitably engender ill-will between the teachers. On commenting on this view of the proposition, His Honor agreed in the inexpediency of calling on one gooroo to report on the proceedings of another, but thought that if one of the teachers was decidedly "superior to the rest in any branch of knowledge, it might be advantageous to entrust to him the instruction of all the classes in that particular branch, in which case the examination of all the classes in the same subject would also be conducted by him."

The Committee decided upon bestowing the English gold medal on Girdharee. In the Urdoo Department, two boys, Bhowanee Pershad and Ramchund, were so equal that the medal could not with justice be given to either. In consequence of the unfavorable state of the Hindee Department, the Committee decided upon reserving the gold medal assigned to it, for next year.

It appeared from the 8th paragraph of Lieut. E. K. Elliot's minute and from a memorandum by the Head Master, that the three gold medals in the hands of the Local Committee were obtained from funds subscribed by native gentlemen in the year 1845. The entire sum raised was Rs. 350, with which, four Silver and three Gold Medals were obtained direct from Europe.

Of these, the four silver medals were awarded in the year 1847 to the students who had made the most rapid progress in any Department of study.

JUBBULPORE SCHOOL.

The result of the examination held at this School on the 23rd of March, 1850, drew from the Local Committee (in making their usual report) the opinion, that as the present condition of the Institution was far from vigorous, and as no great improvement could reasonably be anticipated, they did not recommend that it should be kept up any longer; at any rate, upon the same footing on which it then stood.

The Lieut.-Governor remarked in reply, that it had long been his own opinion that Schools constituted like those of Jubbulpore and Saugor, were seldom of great benefit. They did not afford the means of advanced instruction in any department of knowledge; nor could they hold out any but small rewards to stimulate in the pupils the desire of high proficiency. Private individuals, too, and Societies were deterred by their existence in any place, from forming Schools of equal efficiency there, whilst their support diverted from more beneficial purposes a considerable portion of the funds, originally limited, which the Government is enabled to appropriate to educational purposes.

On these accounts, the Lieutenant Governor felt disposed to adopt the recommendation of the Committee, and close the School. He did not, however, think it would be advisable to appropriate the sums which would then revert to the fund, to the formation of Indigenous Vernacular Schools on the plan of the Resolution of February 9th, 1850, because the efficiency of that scheme depended so much on its superintendence, and the distance would of course render the care of the Visitor General at Agra unavailable. He was more disposed to think that a College constituted on the model of those at Agra, Dehlie, and Benares, and which should afford the means of acquiring a superior education was the first object to be aimed at. He believed that such an institution would prove a most important instrument for the propagation of knowledge. Nor would its influence be felt merely within the limits of the locality where it was placed: its influence would probably be extended throughout the population, in general, of the Saugor and Nurbudda Territories, the supply creating the demand as experience had shown was so frequently the case in educational undertakings. In connexion with such an Institution might afterwards be united an agency for inspecting and improving the Indigenous Vernacular Schools within a convenient distance.

The state of the fund would not however permit at present the execution of this scheme, and it would have temporarily to lie in abeyance.

The opinion however of the Committee was requested as to whether Saugor or Jubbulpore possessed the greater advantages when viewed as localities for a large Educational Institution.

To this letter the Committee rejoined that it was their unanimous opinion that a College as proposed by the Lieutenant Governor, would be best suited to the requirements of the Territories, and they thought that Saugor would be the most appropriate place for its foundation.

In consequence of these communications, the School at Jubbulpore was closed on the 1st of January, 1851. The Head Master and Mr. Concanon accepted an offer of being transferred to Benares, where they were entertained as supernumeraries on the College establishment. The Native Masters were dismissed with a gratuity of six months' salary. The moveable property was all made over to the Saugor School, with the exception of some books and maps, which were presented, on application, to the Jubbulpore Church Committee.

The School building was ordered to be sold by auction for the benefit of the Education Fund.

APPENDIX.

APPENDIX.

No. — OF 1851.

FROM J. THORNTON, Esq.,

Secretary to the Government, N. W. P.

TO COLONEL J. LOW, C. B.,

Governor General's Agent, Rajpootana, at Ajmere,

Dated Agra, the —— March, 1851.

SIR,

With reference to the correspondence noted in the margin,* I am desired to forward, for your information, the annexed copy of a Resolution establishing at Ajmere an Educational Institution, which it is hoped may in time be formed into a College, with the full establishment, and with the range of education usually assigned to places of that designation.

* To Colonel Sutherland, dated 3rd April, 1847.
To Lieut.-Col Dixon, dated 28th June, 1849

2nd. The Lieutenant Governor solicits your acceptance of the office of President of the Committee, and hopes that, in that capacity, you will give the whole weight of your influence and exertions to the furtherance of the objects of the Institution.

3rd. Referring to paragraph 8th of my letter of April 3rd, 1847, to the Secretary with the Governor General, of which a copy was forwarded to your predecessor on the same date, I am desired to observe that the Institution should rest its claims for consideration and patronage of the surrounding native States, entirely on its own merits. It would therefore be premature at present to make any announcement of its foundation to those native States. It should be left for a time to work its own way, and even its own title to public confidence and favor. But if the expectations which are entertained of its success be hereafter realized, it is hoped that you will feel yourself at liberty to recommend it n its state of more mature advancement, as an Institution deserving of the liberal support of those, for whose benefit it is mainly founded. In the meantime, it may be hoped that some of the youth of the neighbouring country may be disposed to avail themselves of the advantages now placed within their reach, and put to the test the benefits which it is calculated to confer upon them.

I have the honor to be, &c.,

AGRA: (Signed) J. THORNTON,

The —— March, 1851. *Secretary to the Government, N. W. P.*

Resolution by the Hon'ble the Lieutenant-Governor of the North Western Provinces.

Read again the proceedings of

1. April 3rd, 1847, No. 29 A. and B.
2. May 12th, 1847, Nos. 47 and 48.
May 18th, 1848, No. 144, and Resolution of same date.
June 28th, 1849, No. 90.
August 29th, 1849, Nos. 94 and 97.
November 4th, 1850, No. 1. 3.
February 11th, 1851, Nos. 44 and 45.

1st. The above proceedings show how funds have been provided for giving effect to the establishment of an Educational Institution at Ajmere, approved and sanctioned by the Hon'ble Court of Directors in their Despatch in the Public Department, No. 36, dated July 9th, 1847.

2nd. Doctor Buch, the Superintendent of the Institution, is now in Agra on his way to Ajmere, and it remains to detail the arrangements which are necessary to give effect to the contemplated measure.

3rd. The Local Committee of Public Education at Ajmere will consist of the Superintendent, Lieutenant Colonel Dixon, and his Assistant, and of the Civil Assistant Surgeon. The Agent to the Governor General will be requested to assume the office of President, and the Committee will consider themselves at liberty, at any time, to propose the addition to their number of any European or Native gentlemen, whom they may consider able to assist them, and willing to co-operate with them. The Superintendent of the Institution will be Ex-officio Secretary to the Committee.

4th. The establishment will consist of the strength noted in the margin.* Mr. Wiggins, now an extra Master in the Agra College, will draw the usual authorized travelling allowance to enable him to join at Ajmere. The Committee at Ajmere will nominate persons to fill the vacant situations, as soon as they may decide on the selection. The Superintendent will at first reside in the building appropriated for the School at Ajmere; if, hereafter, it appear advisable that he reside elsewhere, he will draw Rs. 50 per mensem for house rent, till a suitable building be erected for his accommodation.

C. Buch, Ph Dr., Superintendent,		400
Mr. G. Wiggins, first Master,		
Fixed salary,	150	
Personal, ..	100	
		250
Sookhdeo Buksh, second Master,		80
Rama Chund Mookerjee, Assistant		
Junior Teacher,	10	
Librarian, ..	10	
		20
Urdoo Teachers, ...		66
Hindee Teachers, ...		66
Servants, ...		20
Per mensem, ...		902

Contingencies (as usual.)

5th. It is premature at present to found scholarships, but if the Institution succeeds, and the Committee find themselves in a position soon to recommend provisions of this nature for their most deserving scholars, an application to that effect will be favourably entertained.

6th. A sum of money will be authorized for the purchase of books for the Institution. These books, added to those which can be given from the Government stores, will form the commencement of a College Library. In addition to these, Doctor Buch takes charge of a considerable number of books, which he will sell on account of the Government. The Curator of School Books, at Agra, will arrange for supplying the agency at Ajmere, and for bringing the proceeds of the sale to credit in his accounts. All School-books furnished to the pupils should be paid for by them.

7th. The Lieutenant Governor considers it of the utmost importance that a moderate fee be demanded for the instruction of the youths in the Institution, from its first foundation. The fees should consist of an entrance payment, and such moderate monthly sum as may be judged most suitable by the Committee. The advantages of this rule are, that it places education on a right footing, as an advantage requiring some sacrifice on the part of those to whom it is offered; that it keeps the pupils of the Institution select and well behaved, and ensures their regular attendance, and that it prevents the Institution from being the means of depriving of their support those who now gain a livelihood by teaching. The only exceptions to the demand of payment should be in favour of a limited number of free scholars, who might be elected from other local Schools, for their proved attainments. It is especially desired that the principle here prescribed be not deviated from, without a further reference to the Government. The sums obtained as fees for schooling should be devoted to the purchase of books, philosophical instruments and so forth, at the discretion of the Committee, but the amount must be shown in the annual accounts.

8th. It is most important that the Institution be made the centre of a circle of local Schools in the provinces of Ajmere and Mairwarrah. Colonel Dixon has been already employed in organising and superintending such Schools, and will no doubt be ready to make them over to Dr. Buch's care. The Lieutenant Governor is prepared to place under the Committee an establishment of the same nature as that now entertained under Mr. Reid, the Visitor General of Village Schools, in the North Western Provinces, by the Resolution of 9th February, 1850, but the salaries of the persons employed will be on a lower scale, more adapted to the standard generally prevailing in the province. The Lieutenant Governor anticipates much advantage to the country, from the introduction of a good system of vernacular teaching into the province, and from the stimulus which such a

system will receive from the existence in Ajmere of a superior place of education, where the upper classes, or the more promising boys of the lower classes, may receive instruction in the higher branches of learning.

9th. It is requested that the Committee will furnish a special Report to Government as soon as they have filled up the details of this organization, and are able to judge of their future prospects.

By order, &c. &c.,

J. THORNTON,

Secy. to Govt., N. W. P.

Studies in which Competitors for gaining or holding Scholarships in the English Department of the Agra College, are expected to qualify themselves during the year 1851.

1st Class.—Addison's Essays; Milton, four Books; Shakespear's Macbeth, Hamlet, and Midsummer Night's Dream; Hume's Henry VIII., Elizabeth and Charles I.; Gibbon, the Reign of Justinian, and the History of Mahomed and the Caliphs; Paley's Natural Theology; McCulloch's Political Economy; Lectures on the Mogul Empire and British India; Blackstone's Commentaries, 1st vol.

Additional reading required of Senior Students.

Henry IV., V. and VI.; Milton, 5th and 6th books; Hume, from the commencement to the Reign of James II., inclusive; Gibbon, 1st and 3rd chapters (Rome under the Antonines), chapter 44th on the Pandects, and chapter 68th, the downfal of the Roman Empire in the East; Blackstone, half the 2nd volume (first nineteen Chapters); Bacon's Essays, about half the work.

Science.

1*st Division.*—Pratt's Principles of Mechanical Philosophy, Statics, and the first two and 7th chapters of Dynamics, and the two first chapters of Hydrostatics, as far as Clairant's Theorem; Griffin's Optics; Hymer's Astronomy.

2*nd Ditto.*—The Differential and Integral Calculus, and Mechanics, as taught in Whewell's Elements, L. U. K.

3*rd Ditto.*—The Conic Sections and Plane and Spherical Trigonometry.

Both Divisions.—The Principles and Practice of Topography and Elements of Architectural Drawing; Experimental Philosophy, as taught in the Principal's Lectures.

2ND CLASS.—Richardson's Selections; Pope's Essay on Criticism and Goldsmith's Traveller. *History.*—Marshman's India; Goldsmith's Greece and Rome and the Eton Chronology of England. *Geometry.* The first six, and the 11th and 12th books of Euclid.—*Algebra.* As far as Simple Equations inclusive; Arithmetic generally; Introductions to Mechanics, Hydrostatics and Pneumatics, L. U. K. Clift's Political Economy, and Yates' Geography, the whole of each.

3RD CLASS.—The whole of Prose Reader, No. 5, and Poetical Reader, No. 4; the whole of Yates' Geography; Outlines of the History of England, and Marshman's Brief Survey of History, Part 1st; the first four Books of Euclid, and Arithmetic generally; Algebra as far as Involution and Evolution.

4TH CLASS.—The half of Prose Reader No. 5, and Poetical Reader, No. 3; Outlines of Geography, with the form and divisions of the Earth; Arithmetic, as far as Compound Proportion; the first Book of Euclid.

NOTE.—The studies of the classes junior to the above, will be graduated similarly downwards; promotions to the senior class from the class below require that, in addition to proficiency in the other studies of the class, students be masters of the first four Books, the Definitions of the 5th and the 6th, 11th and 12th Books of Euclid; also Algebra to Simple Equations inclusive.

By Order of the Committee,

(Signed) J. MIDDLETON,
Secretary L. C. P. I.

AGRA COLLEGE:
The 17th February, 1851.

Studies in which Competitors for gaining or holding Scholarships in the Oriental Department of the Agra College are expected to qualify themselves during the year 1851.

ARABIC CLASS.—1*st Division.*—Hidayah, the last half; Tawarikh Yæmuni, half the work; Humdoolla, the Regulations and Kholasa-Malka, the whole of each.

2*nd Division.*—Furayez-i-Shurefee, the whole; Shashee, the whole; Tawarikh Timoori and Maibudee, the whole.

3*rd Division.*—Arabic Grammar and Reader, the whole.

The whole Class.—Arithmetic, Algebra, as far as Simple Equations, Euclid and Plane Trigonometry.

1st Persian Class.—*1st Division.*—Qusaid Anvarri, Ukhlaq Nasuri.

2nd Division.—Quwaid Anvarri, Ukhlaq Jellali.

3rd Division.—Budr Chaj, Towqiat Kisra, Qusaid Oorfee, Abdool Vasay, Zahoori and Chargoolzar.

2nd Persian Class.—*1st Division.*—Aboolfuzl, 1st Part; Sicundernamah, 100 pages; Chargoolzar, 20 pages.

2nd Division.—Complete the Goolistan with Preface; Madhoram, half the book (60 pages.)

3rd Division.—Goolistan, from pages 44 to 107, omitting the 5th Chapter; Insha Khuleefa, half the book, 30 pages.

4th Division.—Goolistan, from page 11 to 44 of the Class-book.

1st Urdoo Class.—*1st Division.*—Ukhlaq Jellali; Gilchrist's Risala; Bagh-o-bahar, the whole of each.

2nd Division.—Ditto, a part of ditto ditto.

1st Sanscrit Class.—*1st Division.*—Siddhant Kowmudi, from page 500 to 600; Prowr Munorma, 100 pages; Mitakshara, Achar Abbhiaye, 100 pages; Ootur Ram Charitr (Natuk,) the whole; Sankrabatta Kowmudi, 50 pages; Siddhant Chundroday to the Preitich Khand.

2nd Division.—Mudh Siddhant Kowmudi, 100 pages; Rughoovansh, the whole; Magha Kavya, 200 pages.

2nd Sanscrit Class.—Magha Kavya, from page 280 to 554; Rughoovansha Kavya, 437 pages; Mudh Kowmudi, 170 pages; Brief Survey of History, and Clift's Geography; Lilavati, Bij Gunit, and Arithmetic, the whole; Euclid, 4 books; Algebra, the fundamental Rules.

1st Hindee Class.—Mahabharut, 3½ volumes; Ramayan, the whole; Clift's Geography, the whole; Euclid, 1st, 2nd, 3rd 4th and 6th books.

By Order of the Committee,

(Signed) J. MIDDLETON,

Secy. L. C. P. I., Agra.

Agra College:

The 17th February, 1851.

Note.—The studies of the classes junior to these in each of the above Departments, will be graduated downwards similarly.

Course of Study proposed to be followed in the Dehlie College, during the year 1851.

1st English Class, 18 *Pupils.*

1. Shakespear's Midsummer Night's Dream.
2. Dryden's Absolom and Achitophel and Pope's Essay on Criticism.
3. Bacon's Advancement of Learning.
4. Warren's Selections from Blackstone, as far as 205 pages.
5. Elphinstone's History, 1st Volume.
6. Keightley's England, from the accession of James I. to the Revolution of 1688.
7. Hymer's Conic Sections, with the exception of the General Equation.
8. Wood's Mechanics.
9. Hall's Differential Calculus, three first chapters.
10. Revision of Algebra, Geometry and Plane Trigonometry.
11. Composition.
12. Drawing.
13. Surveying.
14. Urdoo.
15. Prem Sagur, 150 pages.

2nd English Class, 18 *Pupils.*

1. Goldsmith's Deserted Village and Traveller.
2. Milton's first Book of Paradise Lost.
3. Goldsmith's Citizen of the World, Calcutta edition, to letter 61, inclusive.
4. Keightley's Rome.
5. Wayland's Political Economy, book 1st.
6. Geometry, revision of 1st, 2nd, 3rd books and the 4th, 6th and 11th.
7. Bridge's Algebra, as far as page 186, with the omission of Unlimited problems.
8. Composition.
9. Drawing.
10. Prem Sagur, 152 pages.
11. Translation from English into Urdoo.

3rd English Class, 26 *Pupils.*

1. Keightley's Greece.
2. Poetical Reader No. 3, chapter 3.
3. Prose Reader No. 7, 3 chapters.
4. Goldsmith's Geography, the whole.

5. Vulgar and Decimal Fractions.
6. Bridge's Algebra as far as Simple Equations.
7. Geometry as far as Euclid's 3rd Book.
8. Translation from Urdoo into English, and *vice versâ.*
9. Selection from the Intikhab ool Dewan, 100 pages.
10. Prem Sagur, 100 pages.

4th English Class, 24 *Pupils.*

1. Marshman's Brief Survey of History, part 1st.
2. Poetical Reader No. 2, part 1st.
3. Azimgurh Reader No. 1, 100 pages.
4. Lennie's Grammar.
5. Clift's Geography, the whole.
6. Arithmetic, Reduction, Rule of Three, Vulgar Fractions and Decimal Fractions.
7. Intkhab-ool-Dewan, 100 pages.
8. Lital Pucheesee, 50 pages.
9. Translation from Urdoo into English, and *vice versâ.*

5th English Class, 30 *Pupils.*

1. English Reader, No. 4, the whole.
2. Poetical Reader, No. 1, chapter 2nd.
3. Wollaston's Grammar, the whole.
4. Clift's Geography as far as Asia.
5. Arithmetic as far as the Rule of Three, inclusive.
6. Goolistan to the end.
7. Translation from Urdoo into English and *vice versâ.*

6th English Class, 19 *Pupils.*

1. Prose Reader, No. 3, to the end.
2. Ditto Ditto, No. 4, the whole.
3. Wollaston's Grammar, the whole.
4. Arithmetic as far as Reduction, inclusive.
5. Moofeed-oos-Sibeean.
6. Translation from Urdoo into English and *vice versâ.*
7. Clift's Geography as far as Asia inclusive.

7th English Class, 21 *Pupils.*

1. Prose Reader, No. 2, to the end.
2. Ditto Ditto, No. 3, the whole.
3. Wollaston's Grammar as far as Syntax, inclusive.
4. Arithmetic as far as Reduction, inclusive.
5. Goolistan, to the end.

8th English Class, 25 *Pupils*.

1. Reader, No. 2, the whole.
2. Ditto, No. 3, half.
3. Arithmetic as far as Simple Division.
4. Wollaston's Grammar, as far as Etymology, inclusive.
5. Moofeed-oos-Sibeean.

9th English Class, 5 *Pupils*.

1. Reader, No. 1.
2. Spelling.

DEHLIE COLLEGE, (Signed) J. CARGILL,
The 10*th February*, 1851. *Principal*.

Course of Study proposed to be followed in the Dehlie College, during the year 1851.

Oriental Department.

1*st Arabic Class*, 5 *Pupils*.

1. Door-ool-Mukhtar to Babool talceq, 282 pages.
2. Tawarikh Yamunee.
3. Hamasa, 1st, 4th.
4. Sallam-ul-alum, whole.
5. Prem Sagur, 100 pages from 17th chapter.

2*nd Arabic Class*, 1*st Division*, 5 *Pupils*

1. Sharah Waqayah, 288 pages.
2. Meer Qootbee, whole.
3. Qootbee, ditto.
4. Shashi, ditto.
5. Tawarikh Taimuri, 256 pages.
6. Prem Sagur, 100 pages from 17th chapter.

2*nd Arabic Class*, 2*nd Division*, 7 *Pupils*.

1. Qootbee, whole.
2. Meer Qootbee, whole.
3. Maqamat-i-Hareeri, 2 volumes, 135 pages.
4. Qodooree, 2 volumes.

3*rd Arabic Class*, 7 *Pupils*.

1. Sharah Mulla to behes ool vao, 136 pages.
2. Tehzeeb, whole.
3. Sharah Tehzeeb.
4. Maqamat-i-Hindi, whole.
5. Prem Sagur, 50 pages.

1st Shea Class, 1 Pupil.

1. Sharah Summa, from page 100 to 200.
2. Malamal oosool, from page 100 to 150.
3. Hamasa, 1st, 4th.
4. Tawarikh Yamuni.
5. Sallam-ul-alum, whole.
6. Prem Sagur, 100 pages from 17th chapter.

2nd Shea Class, 7 Pupils.

1. Sharah-ool Islam, from page 183 to 311.
2. Qootbee, from Tasawwarrat to the end.
3. Mir Qootbee, whole.
4. Tawarikh-i-Taimuri, 1st half.
5. Prem Sagur, 100 pages from 17th chapter.

3rd Shea Class, 1st Division, 2 Pupils.

1. Mukhtasuri Nafa to Kitab-ul-zakat.
2. Tehzeeb, whole.
3. Matama-ti-Hindee, 1st half.
4. Sharah Moolla to Majrurat.

3rd Shea Class, 2nd Division, 4 Pupils.

1. Kafyah, whole.
2. Mukamat-i-Arbi to the end of Naqliyat.
3. Kulála-o-Damnah.
4. Prem Sagur, 50 pages.

1st Persian Class, 1st Division, 4 Pupils.

1. Rukkaat-i-Mirza Baidil, 1st half.
2. Deewan-i-Nasir, whole.
3. Jwaharul Hareef Quwaid, whole.
4. Prem Sagur, 100 pages.

1st Persian Class, 2nd Division, 18 Pupils.

1. Tahir Wahid to Ustarlab.
2. Zahira-i-Tafrashi, whole.
3. Kasayad Urfi, whole.
4. Prem Sagur, 100 pages.

2nd Persian Class, 1st Division, 4 Pupils.

1. Punj Rooqa, whole.
2. Mina Bazar, whole.
3. Seh Nusur Zahuri, whole.

4. Nal Daman.
5. Bital Pucheesee, to the end.

2nd Persian Class, 2nd Division, 7 Pupils.

1. Sikandernamah, whole.
2. Abulfuzl to the end of 1st Dufter.
3. Ruqqaat-i-Alumgiree, whole.

3rd Persian Class, 1st Division, 4 Pupils.

1. Nal Daman, 129 pages.
2. Abulfuzl, 129 ditto.
3. Quwaid-i-Farsi, whole.

3rd Persian Class, 2nd Division, 13 Pupils.

1. Ruqqaat-i-Alumgiree, whole.
2. Zalikha, whole.

3rd Persian Class, 3rd Division.

1. Bostan, whole.
2. Insha Khalifa, whole.

1st Sanscrit Class, 10 Pupils.

1. Siddhant Kowmoodi, from Bhoodhritoo to Tigunta.
2. Manorama to Puncha Saudhih.
3. Amurkosh, 3d chapter.
4. Bhatti Kavya, three first chapters.
5. History of the Mogul Dynasty, 100 pages.

2nd Sanscrit Class, 10 Pupils.

1. Siddhant Kowmudi, from beginning to Ujunt nupoonsukh ling.
2. Hitopadesha, as first chapter.
3. Amarkosh, first chapter.
4. Rughoovunsh, 4th and 5th books.
5. History of the Mogul Dynasty, 100 pages.

3rd Sanscrit Class, 5 Pupils.

1. Mudhya Kowmudi, from beginning to bhoaad-purismaypud.
2. Hitopadesha, first bhág.
3. Moofeed-oos-Sibyan, 50 pages.

SCIENCE.

1st Class.

1. Integral Calculus, 93 pages.
2. Waud's Algebraical Geometry, from Hyperbola, 38 pages.

3. Webster's Hydrostatics, whole, with the exception of Chap. 4th.
4. Abulfeeda, 2nd vol.

2nd Class.

1. Differential Calculus to Maxima and Minima.
2. Hutton's Dynamics, whole.
3. Waud's Algebraical Géometry.
4. Abulfeeda, 2nd vol.

3rd Class.

1. Spherical Trigonometry and Conic Sections.
2. Algebra, whole.
3. Hutton's Statics, whole.
4. History of England, from James I. to the end.

4th Class.

1. Plane Trigonometry, whole.
2. Algebra to Simple Equations.
3. Natural Philosophy, Hydrostatics, Pneumatics and Optics.
4. Brief Survey of History, part 1st.

5th Class.

1. Euclid 11th and 12th books.
2. Natural Philosophy, Hydrostatics, Pneumatics and Optics.
3. Algebra, from Simple Equations to Maxima and Minima.
4. History of Bengal, whole.

6th Class.

1. Euclid, 2nd, 3rd and 6th books.
2. Mechanics, whole.
3. Geography, Europe.
4. Arithmetic.

DEHLIE COLLEGE: (Signed) J. CARGILL,
The 10th February, 1851. *Secy. Local Com. P. I.*

Course of Studies of the Senior English Department of the Benares College during the Session 1851.

Class.	Literature.	Science.	Oriental.
First Class, Senior Department.	Shakespeare's Othello, the whole. Milton's Paradise Lost. The first two Books. Whateley's Rhetoric, (from the beginning to page 236). The whole of "Conviction" and "Persuasion." Macaulay's History of England, from page 428 to the end of vol. 1st. Brougham's Political Philosophy, from the beginning to page 160. The first four Chapters of vol. 1st. Arnold's Lectures on Modern History. The first four Chapters.	Abercrombie's Intellectual Powers, the first 108 pages, (from the beginning to the end of Imagination,) Geometry (solid) C. E. C. the first two Books and Conic Sections (Parabola and Ellipse). Algebra (Hind's). The first 212 pages. Practical Mathematics, C. E. C. Plane. Trigonometry and the Mensuration of Surfaces. Ritchie's Calculus. The first two parts.	Sanscrit, Dr. Ballantyne's Lectures on the Nyaya Philosophy, the whole; also Lecture on the Sankhya Philosophy.
Second Class, Senior Department.	Shakespeare, Richard 3rd, the whole. Milton. The first two Books, (Paradise Lost.) Keightley's England, vol. 2nd. From page 93 to 263. Thornton's Chapters on India, from the beginning of the Pindaree War to the end. Russell's Modern Europe, vol. 1st. From page 1 to page 142.	Abercrombie's Intellectual Powers. The first 108 pages, (from the beginning to the end of the "Imagination." Algebra, (Hind's), to the end of "Permutation" and "Combination." Plane Geometry, C. E. C. Quadrature of Circle, Additional, 2nd Book, Plane Trigonometry. Practical Mathematics, C. E. C. Plane Trigonometry. Arnott's Physics, (5th edition), from the beginning to page 189. Chemistry, from page 36 to 60. Astronomy, (Herschell's), from page 63 to 106. Solid Geometry. The 1st and 2nd Books.	Urdu. Fasánsi Ajaib, from page 43 to 103. Persian. Anwar Sohilli, from the beginning of the Hekaet to the end of the 5th, (to page 20). Ballantyne's Resala, the whole.

Class.	Literature.	Science.	Oriental.
Third Class, Senior Department.	History of England, (Keightley's), from Edward I. to Edward III., from page 143 to 222. History of Rome, vol. I., (Lardner's), from page 56 to 116. Macbeth, from beginning of Act III. to the end of Act IV.	Plane Geometry, C. E. C. First 3 Books. Algebra (Haddon's) to Surds. Arithmetic, generally. Mechanics, from the beginning to page 30. Chemistry, from the beginning to page 30. Lessons on Reasoning, from the beginning to page 56.	Persian, 1st division. Anwar Sohilli from story of the Pigeon to the story of the Kite. Urdu. Fasánai Ajaib, from page 94 to the end. Resala. The whole. Second division. Urdu. Bagh-o-Bahar. The whole. Ballantyne's Resala, the whole. Gulistan, from the 1st Hekaet to the end of the 25th of Chapter 8th.

Course of Studies of the Anglo-Sanscrit Department of the Benares College, during the Session 1851.

	Literature.	Science.
1	English Reader, No. 5th, 150 Pages.	Portions of Vedya Chakra.
2	Milton, 1st Book, (Paradise Lost.)	
3	Introduction to the Inductive Philosophy, from Mill.	
4	Some portion of Grecian History, (Chambers').	

Course of Studies of the Senior Arabic and Persian Department of the Benares College, during Session 1851.

	Literature.	Science.
Arabic, 1st Class.	Hidayah, from the beginning to page 200. Mootenabbee, from the beginning to page 100. Tawarikh Taimuri, from the beginning to page 66.	Euclid, 1st three Books. Algebra, from the beginning to Quadratic Equations. Geography, (Mannu Lal's), from the beginning to page 50.
Arabic, 2nd Class.	Sharh-Vuqayah, from the beginning to page 161. Shashee, from the beginning to page 40. Tawarikh Taimuri, from the beginning to page 60.	Euclid, 2nd and 3rd Books. Algebra, as far as Simple Equations. Geography, (Mannu Lal's), from the beginning to page 50.
Persian, 1st Class.	Hia-i qool Balaghat, from 2nd to 4th Hidayah, 64 pages. Qusaid Oorfee, from the beginning to 50th page. Nahv Mir, the whole. Akhwanus-safa, from the beginning to page 50. Zuhoori, the whole. Muntakhib-oon-nahv, the whole. Sair-ool-Mutakharin from dufter 2nd to page 50.	Algebra, from Division to Simple Equations. Euclid, 2nd and 3rd Books. Geography, (Mannu Lal's), first 50 pages.
Persian, 2nd Class.	Insha-i-Tahir Wahid, first 35 pages. Dewan-i-Sayeb, first 50 pages. Mirat-ool-khyal, from page 27 to page 70. Chahar Sharbat, first 27 pages. Nahv Mir, the whole. Alif Leila, first 20 pages.	Euclid from Proposition 23rd to 48th, 1st Book. Geography, (Clift's) Europe. Algebra, from the beginning to Division.

Course of Study proposed to be followed in the Roorkee College, during 1851.

First Department.

Practical Trigonometry and Mensuration; Mechanics; Materials and their application; Strength of Materials and Stability of Structures, Construction; Measuring and Estimating; Outlines of Architecture; Moving Powers and Mechanics; Interior Communication; Practical Hydraulics; Principles of Geography and Geodesy.

Text Books.

Weisbach's Mechanics of Machinery and Engineering; Mahans' Civil Engineering, Treatise on Architecture; Building, Carpentry from the Encyclopædia Britannica, Tredgold's Carpentry; Abbott's Bridges, and Cautley on Well Foundations; Wood on Railroads; Weale's Rudimentary volumes, Foundations, Roads, Blasting and Quarrying, Draining of Lands; Hughe's Mathematical and Physical Geography, Galbraith's Mathematical and Astronomical Tables.

Second Department.

Practical Geometry; Algebra; Plane Geometry; Application of Algebra to Geometry; Plane Trigonometry; Mensuration; Mechanics; Building Materials and Construction; Measuring and Estimating; Strength of Materials; Interior Communication and Draining.

Text Books.

Elliot's Practical Geometry and Mensuration, Tate's Algebra; Tate's Principles of Geometry, &c.; Hutton's Geometry; Abbott on Bridges, and Cautley on Well Foundations; C. E. College Papers; Weale's Rudimentary volumes, Mechanics, Art of Building, Blasting and Quarrying; Foundations, Roads, Railways, Draining of lands; Hindustani, Anglo-Hindustani Idiomatic Exercises; Ramsurun Dass' Accharabhiyas and Phailawut; Nuqlíát-i-Hindi, Ballantyne's Interpreter.

Third Department.

Junior Division.

Practical Geometry; Higher Arithmetic; Mensuration; Plane Geometry; Algebra, Plane Trigonometry.

Senior Division.

Conic Sections; Mechanics and Hydrostatics, Materials and Construction, Measuring and Estimating; Analytical Geometry; Spherical Trigonometry; Principles of Geography and Astronomy; Outlines of Optics, Heat, Electricity.

LIBRARY

Text Books.

Ajoodhiapurshad's Practical Geometry; Hisáb or Mumlook Ali's Euclid; Thomason's Ditto; Elliot's Mensuration translated by Behari Loll; Ram Chundur's Algebra; Ditto Trigonometry and Conic Sections; Elements of Natural Philosophy translated by Ajoodhiapurshad and Dhurm Narain; Webster's Hydrostatics; Abbott on Bridges, and Cautley on Well Foundations translated by Mannu Lall; C. E. College Papers, (Ditto Ditto) Hughe's Principles of Geography (Ditto Ditto).

Surveying Course.

I.—Application of Practical Geometry on the Field.
II.—Surveying and Measuring.

1st.—Without instruments for observing angles. Chain measurements of fields and calculation of areas. Preparation of ground-plans from measurement of buildings. Laying down measurements of buildings from plans.

2nd.—With instruments for observing angles.
Prismatic Compass.
Protraction by Bearings.
Theodolite.
Protraction by Traverses.
Areas by Universal Theorem.

III.—Levelling, Construction of Sections, Contouring, construction and adjustment of Instruments.
IV.—Laying outlines, Curves and Cuttings.
V.—Route Surveying and Field Sketching.

Books of Reference.

Adam's Geometrical Essays, William's Geodesy, Gibson's Surveying, Simm's Mathematical Instruments.

Drawing Instruments.

Boileau's Traverse Tables; Simm's Field Engineering; Bourn's Surveying; Baker's Surveying.

Third Department.

Ramsurun Dass' Map Tole; Ditto Putware-ke-kitab; Hurdeo Sing's Land Surveying, Settlement Misl.

Outline of Drawing Course.

I.—Elementary, Outline pen work, light and shade.

II.—Simple Architectural Plans.

III.—Topographical Drawing; Practice in Enlarging and Reducing.

IV.—Carpentry and Masonry details.

V.—Engineering and Architectural Drawings.

VI.—Implements and Machinery.

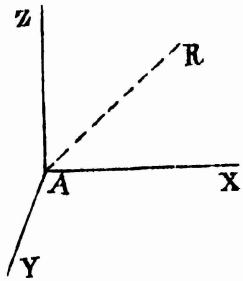
MATHEMATICAL ANSWERS.

Questions in Mathematics and Natural Philosophy, proposed by Government to the Senior Class of the Agra College, and Answers by Sookh Deo Buksh.

Question 1. If a, b, c be the angles which the resultant of three forces acting at right angles to one another makes with each of them respectively, show that,

$$\cos 2a + \cos 2b + \cos 2c = -1.$$

Answer. Let X, Y, Z be the three forces,



and let ZAR = C

XAR = A

YAR = B

Now if these forces represent the three sides of a parallelopiped, then their resultant will be represented by the diagonal of that parallelopiped.

so that $AR^2 = X^2 + Y^2 + Z^2$

$$\text{Now } \cos 2A + \cos 2B + \cos 2C = \cos^2 A - \text{sine}^2 A + \cos^2 B - \text{sine}^2 B + \cos^2 C - \text{sine}^2 C$$

$$= \cos^2 A - 1 + \cos^2 A + \cos^2 B - 1 + \cos^2 B + \cos^2 C - 1 + \cos^2 C$$

$$= 2\left(\frac{X^2}{R^2} + \frac{Y^2}{R^2} + \frac{Z^2}{R^2}\right) - 3$$

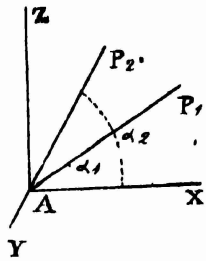
$$= 2\left(\frac{X^2 + Y^2 + Z^2}{R^2}\right) - 3$$

$$= 2\,\frac{R^2}{R^2} - 3 = 2 \times 1 - 3 = 2 - 3 = -1.$$

Note.—The paper of questions set to the pupils contained a double set; one set intended for each Division of the Senior Class. The only questions placed before Sookh Deo Buksh were those intended for the first Division as being the most difficult.

Q. 2. Find the conditions of equilibrium of any number of forces acting on a point.

A. Let A be the point acted upon by any number of forces. Assume it to be the origin of three rectangular axes: Let P_1 P_2 P_3 -------- P_n be the forces which act on that point, and let α_1 α_2 α_3 -------- α_n be the angles which their directions make with the axis of X, and B_1 B_2 B_3 -------- B_n be the angles



which they make with the axis of Y, and γ_1 γ_2 γ_3 -------- γ_n, the angles which they make with the axis of Z. Resolving them in the directions of their axes and taking their sum we get,

$$\Sigma X = P_1 \cos \alpha_1 + P_2 \cos \alpha_2 + P_3 \cos \alpha_3 + \text{----} + P_n \cos \alpha_n$$
$$\Sigma Y = P_1 \cos B_1 + P_2 \cos B_2 + P_3 \cos B_3 + \text{----} + P_n \cos B_n$$
$$\Sigma Z = P_1 \cos \gamma_1 + P_2 \cos \gamma_2 + P_3 \cos \gamma_3 + \text{----} + P_n \cos \gamma_n$$

Put $R^2 = (\Sigma X)^2 + (\Sigma Y)^2 + (\Sigma Z)^2$

In order that there may be equilibrium R must be $= O_1$ or $R^2 = O$: and hence in that case $(\Sigma X)^2 + (\Sigma Y)^2 + (\Sigma Z)^2 = O$

But these forces are independent of each other, and therefore each of these must be $= O$; hence the conditions of equilibrium are that

$$(\Sigma X)^2 = O_1 \ (\Sigma Y)^2 = O_1 \ (\Sigma Z)^2 = O_1$$
$$\text{or} \Sigma X = O_1 \ \Sigma Y = O_1 \ \Sigma Z = O:$$

Q. 3.—State Guldinus's theorem and demonstrate it.

Ans.—There are two theorems invented by that celebrated gentleman.

(1). "The content of a solid of revolution is equal to that of a pyramid whose base is equal to the area of the generating figure, and height equal to the path described by the centre of gravity of that figure." This may be proved in the following manner.

Let C be the content of a solid of revolution; dx. dy an elementary particle of the generating figure; y the distance of this particle from the axis round which the figure revolves: θ the angle of

revolution; $d\theta$ its elementary portion: $Yd\theta$ an elementary portion of the arc described by the elementary portion of the area.

Then the solid content of the elementary portion will be = $dx\,dy.\,yd\theta$

$$\therefore \text{ the whole content } C = \int_\theta \int_x \int_y dx\,dy.\,yd\theta$$

$$= \theta \int_x \int_y dx.\,ydy.$$

But if $\bar{y}$ be the ordinate of the centre of gravity then

$$\bar{y} = \frac{\int\int y.\,dx\,dy}{\int\int dx\,dy}$$

$$\therefore \int\int y\,dx\,dy = \bar{y}\int\int dx\,dy$$

$$\text{and} \qquad C = \bar{y}\theta\int\int dx\,dy$$

(2). The second property is "that the surface of a solid of revolution is equal to the product of the parameter, and the path described by the centre of gravity of the parameter of the generating figure."

Let S = length of parameter of the figure.
,, ds = an elementary particle of it.
,, θ = the $\angle$ of revolution.
Let $d\theta$ = an elementary part of it.
,, y = the distance of ds from the axis of revolution.
Then ds, $yd\theta$ is an elementary portion of the surface,

and the whole surface $= \int\int y\,d\theta.\,ds.$

$$= \theta \int y\,ds.$$

But if $\bar{y}$ be the ordinate to the centre of gravity of the parameter,

$$\text{We have } \bar{y} = \frac{\int y\,ds.}{\int ds.}$$

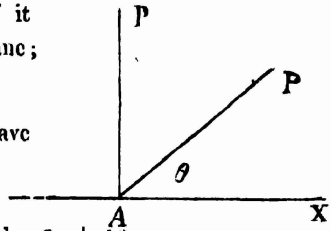
$$\therefore \bar{y}\int ds = \int y\,ds$$

And $\therefore$ the Surface $= \bar{y}.\,\theta.\int ds$

= the parameter $\times$ by the path of the centre of gravity.

Q. 4.—Two equal forces act upon a plane, one perpendicularly, the other obliquely, and their effects are as 3 to 2. Find the inclination of the latter.

A.—The effect of the inclined force is measured by that part of it which acts at rt angles to the plane; and this is P sine θ.



Hence by the question we have

$$P : P \text{ sine } \theta :: 3 : 2$$

$$\text{or sine } \theta = \tfrac{2}{3}$$

$$\log \text{sine } \theta = \log 2 - \log 3 + 10$$

$$= 9{\cdot}823909$$

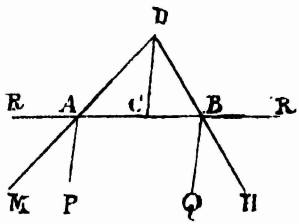
$$= \log \text{sine } 41^\circ\ 48'\ 47''$$

$$\therefore \theta = 41^\circ\ 48'\ 47''$$

Q. 5.—What is the centre of parallel forces and how found?

A.—The centre of parallel forces is that point, at which a single force (equal to the sum or difference of those forces as they act in the same or opposite directions) being applied will produce the same effect. This is determined in the following manner:—

First, we take only two forces. Let P and Q be the two forces acting at the points A and B, it is required to determine the centre of these parallel forces.



At A and B apply two equal forces acting in opposite directions. This will not disturb the equilibrium. Now find the directions of the resultants of PR and QR; and let them be AM and BH: produce them, and let them meet in some point D. From that point draw DC parallel to the directions of the given forces. The point where this line (DC) meets AB is the centre of the parallel forces.

Let AB = a

„ AC = x

then BC = a — x

The sides of the triangles ADC and BDC being in the directions of the forces, we have

$$\frac{AC}{CD} = \frac{R}{P}, \quad \frac{BC}{CD} = \frac{R}{Q}, \quad \frac{CD}{BC} = \frac{Q}{R}$$

$$\therefore \frac{AC}{CD} \cdot \frac{DC}{BC} = \frac{R.Q}{P.R}$$

$$\text{or } \frac{AC}{BC} = \frac{Q}{P}$$

$$\text{i. e. } \frac{x}{a-x} = \frac{Q}{P}$$

$$\text{or } \frac{a-x}{x} = \frac{a}{x} - 1 = \frac{P}{Q}$$

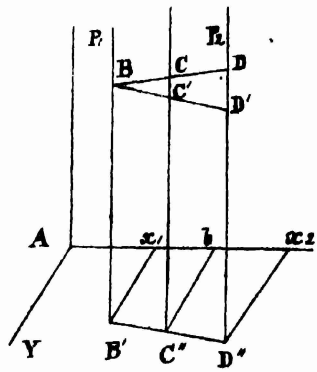
$$\text{or } \frac{a}{x} = \frac{P}{Q} + 1$$

$$= \frac{P+Q}{Q}$$

$$\therefore \frac{x}{a} = \frac{Q}{P+Q}$$

$$\text{and } x = \frac{Q}{P+Q} \cdot a$$

Now we may take several forces, and proceed in the following manner.



Let A = origin of coördinates.

,, B and D = the two points of application of the forces

Let C = their centre. Project them on the plane x y, and let that projection be a line B′C″D″.—Then project these points on the axis of x and let them be x_1, b, and x_2.

$$\text{Then } \frac{BC}{BD} = \frac{BC'}{BD'} = \frac{B'C''}{B'D''} = \frac{x_1 b}{x_1 x_2}$$

$$= \frac{Ab - x_1}{x_2 - x_1} \left\{ \begin{array}{l} \text{where } Ax_1 = x_1 \\ \text{and } Ax_2 = x_2 \end{array} \right.$$

$$= \frac{P_2}{P_1 + P_2}$$

$$\therefore Ab - x_1 = \frac{P_2 x_2 - P_2 x^1}{P_1 + P^2}$$

$$\therefore Ab = \frac{P_2 x_2 - P_2 x^1}{P_1 + P_2} + x_1$$

$$= \frac{P_2 x_2 - P_2 x_1 + P_1 x_1 + P_2 x_1}{P_1 + P_2}$$

$$= \frac{P_1 x_1 + P_2 x_2}{P_1 + P_2}$$

Now take any other force such as P_3 whose abscissa is x_3 : and let Ab_1 be the abscissa of the centre of the forces.

$$\text{Then } Ab_1 = \frac{Ab\,(P_1 + P_2) + P_2 x_3}{P_1 + P_2 + P_3}$$

$$= \frac{\frac{P_1 x_1 + P_2 x_2}{P_1 + P_2}\left(P_1 + P_2\right) + P_3 x_3}{P_1 + P_2 + P_3}$$

$$= \frac{P_1 x_1 + P_2 x_2 + P_3 x_3}{P_1 + P_2 + P_3}$$

Hence generally,

Taking $\bar{x}$ as the coördinate of the centre. $\bar{x} = \dfrac{P_1 X_1 + P_2 X_2 + P_3 X_3 + \cdots + P_n X_n}{P_1 + P_2 + P_3 + \cdots + P_n}$

$$= \frac{\Sigma P x}{\Sigma P}$$

$$\bar{y} = \frac{\Sigma P y}{\Sigma P}$$

$$\bar{Z} \quad \frac{\Sigma P z}{\Sigma P}$$

Q. 6.—Find what weight may be sustained on a plane whose inclination is 10°, by a force of 10lb acting at an angle of 10° with the plane.

A.—Here we have the resolving forces.

$$P.\cos 10^\circ = W.\sin 10^\circ$$

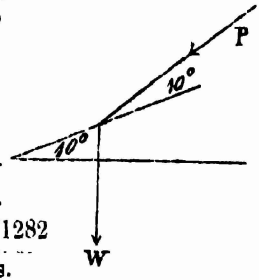
$$\text{or } W = \frac{P.\cos 10^\circ}{\sin 10^\circ}$$

$$= P.\cot 10^\circ$$

$$\text{but } \cot 10^\circ = 5{\cdot}671282$$

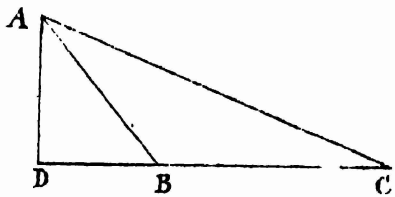
$$\therefore W = 10 \times 5{\cdot}671282$$

$$= 56{\cdot}7182 \text{ lbs.}$$



Q. 9.—AB and AC are two inclined planes, having the same altitude: determine how far a heavy body will descend down the longer AC, whilst another descends through AB: AC being twice AB.

Now the accelerating force in the direction of AC = g. sine ACD, and that in the direction of AB = g. sine ABD:



$$\text{But sine ACD} = \frac{AD}{AC}, \text{ Sine ABD} = \frac{AD}{AB}$$

Let x = the space through which a body will fall along AC in that time in which another falls along AB.—

$$\text{Then } \frac{x}{AB} = \frac{\frac{1}{2}g.\text{sine } ACB.t^2}{\frac{1}{2}g.\text{sine } ABD.t^2} = \frac{\sin ACB}{\sin ABD} = \frac{\frac{AD}{AC}}{\frac{AD}{AB}} = \frac{AB}{AC}$$

$$\text{or } \frac{x}{AB} = \frac{AB}{AC} = \frac{AB}{2AB} = \frac{1}{2}$$

$$\text{or } x = \tfrac{1}{2} AB.$$

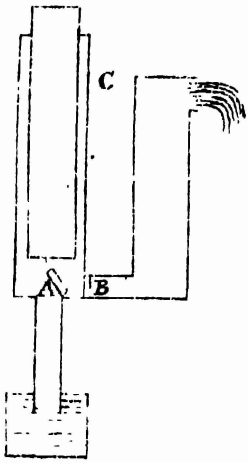
Q. 10.—Describe the construction and use of the barometer.

A.—A glass tube open at one end and shut at the other, of uniform thickness, is first filled up with mercury. Then it is inverted into a cup or glass vessel full of the same fluid, which causes a vacuum to be formed at the top of the tube. But it is necessary that this tube should be longer than 29 inches. It is generally more than 30. This tube is placed against a quadrated wooden (or of anything else)

bar. The rise or fall of the mercury in the tube, which is caused by the increase or decrease of the atmospheric pressure, serves many purposes: such as ascertaining the heights of mountains, and the pressure of the atmosphere at different times.

Q. 11.—Give a brief description of the machines in most ordinary use for raising water.

A.—The most ordinary machines for the raising of water are the Forcing pump: the Archimedian screw: the bucket and the lever: the Persian wheel: the Fire engine: the Hydraulic belt.* The Forcing pump consists of two tubes. In the lower end of one of them a barrel is fitted: and a Piston is made to move up and down in it. The other tube is attached to it at one side. When the Piston is raised, the valve at the bottom opens, and lets the water in. On its descending the valve A shuts itself, and the valve B opens: and the water is forced out the tube BC, through which it rises upwards.



The screw of Archimedes is of the form of a spiral, and as it is turned, water enters in at the bottom, and comes out at the top.

The bucket and lever machine consists of a rod and a basin or bucket attached at one end with a weight at the other. The person lifts the string up and down, and thus the water is raised.

The Persian wheel consists of several buckets and a wheel. These are attached to the circumference of the wheel, and as it is turned, these fill themselves at the bottom, and pour their contents at the mouth of the well, &c., &c.

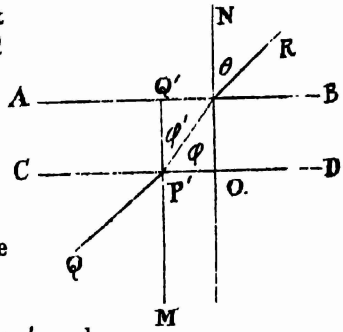
Q. 12.—Explain what is meant by "Latent Heat."

A.—Latent heat is that heat which remains concealed in all bodies.

* In enumerating all these machines as machines for *raising* water the writer has given the term an extended meaning not generally given. He has enumerated machines which *force* up water to a *higher* point, when *raising* is generally supposed to mean *bringing* up from a *lower*.

Q. 13.—Show that when a ray of light passes through a medium contained by two parallel plane surfaces, the directions in which it enters and issues are parallel.

A.—Let AB, CD, be the two surfaces, and RP a ray of light incident at P: then refracted in the direction of PP′, and then it emerges in the direction of P′Q QP′ is parallel to RP.



Let Q′P′P = ψ' and OPP′ = φ
hence Q′P is 11^l to P′O
and Q′P′ to PO

$\therefore \varphi = \psi'$

Now $\frac{\text{sine}\,\theta}{\text{sine}\,\varphi} = \mu$, but afterwards the ray, issues in the same medium.

$$\text{we have } \frac{\text{sine}\,\psi'}{\text{sine}\,\theta'} = \frac{1}{\mu}$$

$$\text{but } \varphi = \psi' \therefore \frac{\text{sine}\,\varphi}{\text{sine}\,\theta'} = \frac{1}{\mu}$$

$$\therefore \frac{\text{sine}\,\theta \times \text{sine}\,\varphi}{\text{sine}\,\varphi \times \text{sine}\,\theta'} = \mu.\frac{1}{\mu} = 1$$

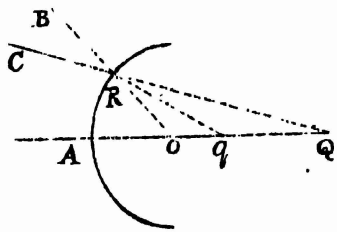
$$\text{or } \frac{\text{sine}\,\theta}{\text{sine}\,\theta'} = 1 \text{ or sine } \theta = \text{Sin } \theta'$$

$$\therefore \theta = \theta'$$

$\therefore$ QP′ is 11^l to RP.

Q. 14.—Find the principal focus of a sphere.

A.—Let AR be a spherical surface: and CR a ray incident in the direction of CQ and refracted in that of Rq. Let them meet the axis of the spherical surface in the points Q and q



Let Aq = V
„ AQ = u
„ AO = r
„ ORQ = θ
„ AOR = θ'
and ORq = φ

$$\text{then } \frac{QO}{RQ} = \frac{\sin\theta}{\sin\theta'} \text{ and } \frac{qR}{Oq} = \frac{\sin\theta'}{\sin\varphi}$$

$$\text{or } \frac{OQ,\ qR}{RQ\ Oq} = \frac{\sin\theta}{\sin\varphi} = \mu$$

and when R coincides with A we have RQ = AQ and Rq = Aq, and this takes place in the case of a principal focus.

$$\text{We have } OQ.Aq = \mu.AQ.Oq.$$

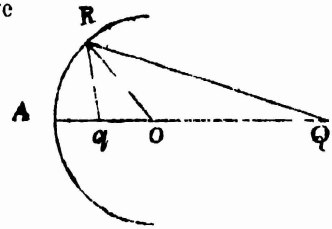
$$\text{or } (\mu - r)\,v = \mu\,u\,(v - r)$$

$$\text{dividing by uvr, } \left\{\frac{1}{2} - \frac{1}{u} = \frac{\mu}{r} - \frac{\mu}{v}\right.$$

$$\text{or } \frac{\mu}{v} - \frac{1}{u} = \frac{\mu - 1}{r}$$

$$\therefore \frac{u}{v} = \frac{1}{u} + \frac{\mu - 1}{r}$$

In the case of Reflexion, we have



$$\frac{QR}{qR} = \frac{OQ}{Oq}$$

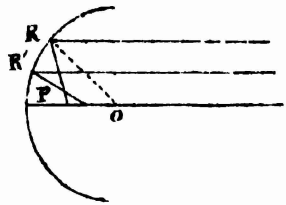
$$\therefore QR.Oq = qR.OQ$$

But in the case of a principal focus, *i. e.* when R coincides with A, we have AQ. Oq = Aq.OQ

$$\text{or } u\,(r - v) = v\,(u - r)$$

$$i.\ e.\ \frac{1}{v} + \frac{1}{u} = \frac{2}{r}$$

Q. 16.—What are Caustics?



A.—The locus of the points of intersection of the reflected rays which are incident in parallel directions is called the curve "Caustic". Here, in the figure, the point P will describe that curve.

Q. 17.—Explain the Astronomical terms "Azimuth," "Altitude," "Amplitude," "Hour Angle," "Prime Vertical."

A.—The "Azimuth" of a star is that angle which is contained between the vertical circle, (passing through that star and the zenith of the place,) and the meridian of that place. On Globes this is represented by that arc of the wooden horizon which is intercepted between the pole and the vertical circle.

The "Altitude" of a star is that part of the vertical circle which is intercepted between the star and the horizon.

The "Hour Angle" of a star is an angle formed by the two successive circles of declination of that star: and is formed at the pole, and is measured by the arc of the Equator intercepted between those two circles of declination.

The "Prime Vertical" is that circle which passes through the East and West points and the zenith of a place.

Q. 18.—Find the latitude of a place, where the sun appears just to touch the horizon without setting, when its declination is 23° 28′ N.

A.—The latitude of a place where the Sun appears to move or to touch the horizon will be = to the complement of the declination; *i. e.* if L be the latitude, we shall have

$$L = 90^\circ - 23^\circ\ 28' = 66^\circ\ 32'$$

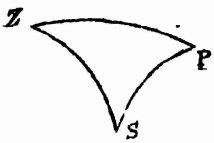
Q. 19.—Explain the method employed for finding the longitude.

A.—The way in which the longitude of a place is determined is this:—first find the place whose longitude is required. Then bring it under the brass meridian on the Globe. Then see what degree of the Equator is under the meridian. This degree thus found will show the longitude of the place East or West.*

Q. 20.—When a heavenly body is 6 hours from the meridian, prove that

$$\text{Sin Alt.} = \sin \text{declination} \times \sin \text{lat.}$$

A.—When a heavenly body is 6 hours from the meridian, then the angle SPZ = 15 × 6 = 90° Hence from the right angled triangle ZPS having a right ∠ at P, we have



$$\text{Sin}\left(\frac{\pi}{2} - ZS\right) = \cos.\ SP \cos PZ.$$

But if P be the pole, Z the zenith, and S the position of the heavenly body, we shall have PZ the co-latitude of the place, let it be (90° — l): also we shall have PS the co-declination of the heavenly body: let it be (90 — δ) also ZS the co-altitude of the heavenly body: let it be (90 — a)

* It appears that the examiner did not intend to ask how longitude was found on the *globe*, and therefore the answer is not exactly the one wanted.

Substituting these values in the equation, we shall have

$$\text{Sine}\left(\frac{\pi}{2}-\frac{\pi}{2}+a\right)=\cos(90-\delta)\cos.(90-l)$$

$$\text{or sine } a = \text{sine } \delta \text{ sine } l$$

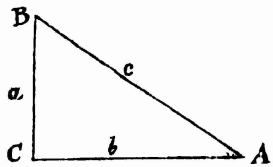
i. e. sine alt. = sine decl. × sine lat.

Q. 21.—Show how your position on the earth's surface can be determined.

A.—On the earth's surface the position of a place is determined by means of the latitude and longitude of the place.

Q. 22.—In any right angled plane triangle C being the right ∠ $\cos 2A = \frac{b^2 - a^2}{b^2 + a^2}$ Required proof.

A.—Let ABC be a triangle having a right ∠ at C.



$$\text{Now } \cos 2A = \cos^2 A - \text{sine}^2 A$$

$$= \frac{AC^2}{AB^2} - \frac{BC^2}{AB^2}$$

$$= \frac{AC^2 - BC^2}{AB^2}$$

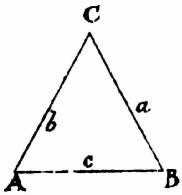
$$= \frac{AC^2 - BC^2}{AC^2 + BC^2} = \frac{a^2 - b^2}{a^2 + b^2} \text{ Q. E. D.}$$

Q. 23.—In a plane triangle, given the two sides 426 feet and 354 feet, and the included ∠ 49° 16′. Find the other parts.

$$\text{Let } C = 49^\circ\ 16'$$

$$a = 426$$

$$b = 354$$



$$\text{Then } A + B = 180^\circ - 49^\circ\ 16'$$

$$= 130^\circ\ 44'$$

$$\tan \tfrac{1}{2}(A - B = \frac{a - b}{a + b} \tan \tfrac{1}{2}(A + B)$$

$$= \frac{72}{780} \tan 65^\circ\ 22'$$

$$\log \tan \tfrac{1}{2}(A - B) = \log 72 - \log 780 + \log \tan 65^\circ\ 22'$$

$$= 9 \cdot 303860$$

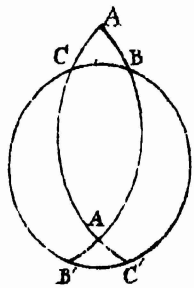
$$= \log \tan 11^\circ\ 22'\ 58''$$

$$\therefore \tfrac{1}{2}(A - B) = 11^\circ\ 22'\ 58''$$
$$\text{or } A - B = 22^\circ\ 45'\ 56''$$
$$\text{and } A + B = 130^\circ\ 44'$$

By Addition and Subtraction

$$2\,A = 153^\circ\ 29'\ 56'' \therefore A = 76^\circ\ 44'\ 58''$$
$$2\,B = 107^\circ\ 58'\ 4'' \therefore B = 53^\circ\ 59'\ 2''$$
$$\text{again } \frac{c}{a} = \frac{\text{sine } C}{\text{sine } A} \therefore c = a\frac{\text{sine } C}{\text{sine } A}$$
$$\log c = \log a + \log \text{sine } C - \log \text{sine } A$$
$$= \log 426 + \log \text{sine } 49^\circ\ 16'$$
$$- \log \text{sine } 76^\circ\ 44'\ 58''$$
$$\text{or } \log c = 2\cdot520615$$
$$= \log 331\cdot5$$
$$\therefore c = 331\cdot5$$

Q. 24.—Having given the three angles of a spherical triangle and the radius of the sphere, to find the area of the triangle.



A.—Let A, B, C, be the angles of the spherical triangle, whose area is required, the radius being r. Produce the sides AB, AC, and BC, till they meet on the other side of the sphere.

Now BC B′C′ is a hemisphere.

Let S be the area of the triangle.

The triangle ABC and A′B′C′ are equal.

$$\text{Now } AB\,A'C + CB'C'A' + BA'B'C' = BCB'C' + 2ABC$$
$$= 2\,\pi r^2 + 2S$$

$$\text{But } ABA'C = \frac{A^\circ}{180^\circ}\,2\pi r^2$$

$$\text{and } BB'C' = \frac{B^\circ}{180^\circ}\,2\pi r^2$$

$$\text{and } CC'B' = \frac{C^\circ}{180^\circ}\,2\pi r^2$$

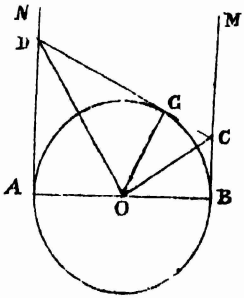
$$\therefore \frac{A+B+C}{180^\circ}\,2\,\pi r^2 = 2\pi r^2 + 2S$$

$$\text{or } 2S = \frac{A+B+C}{180^\circ} 2\pi r^2 - 2\pi r^2$$

$$\therefore S = \frac{A+B+C}{180^\circ} \pi r^2 - \pi r^2$$

$$= \frac{A+B+C-180}{180^\circ} \pi r^2$$

Q. 25. Two parallel tangents AC, BD, are drawn at the extremities of the diameter AB of a circle. Find the centre O, any two straight lines OC, OD, containing a rt. ∠ being drawn to meet the parallel tangents in C and D, the line joining C and D will also be a tangent.



A. Let ABG be a ⊙le
„ AB its diameter,
„ AD and BC two tangents drawn at its extremities. In BM take any point C; join CO. From the point C draw a tangent CG, and produce it till it meets the other tangent AN in D. Now it is required to prove that DOC is a right ∠. For this will be the same thing as first assuming the angle DOC a right angle, and then proving DC to be a tangent.

Because from the same point C two tangents, CG and CB, are drawn, they must be equal to one another. For the same reason AD = DG. Now in the triangles GOC and COB we have CG = CB, OG = OB and OC common; hence the ∠s of the one △ shall be = to the ∠s of the other △.

$$\therefore BOC = COG : \text{ and similarly } AOD = DOG$$

By taking their sum we have $\Big\}$ $BOC + COG + AOD + DOG = 2(DOG + GOC)$

$$= 180^\circ$$

$$\therefore DOG + GOC = \frac{180^\circ}{2}$$

$$\text{or } DOC = 90^\circ$$

$$= \text{a rt.} \angle$$

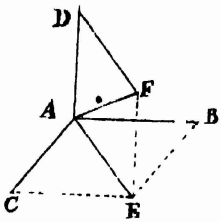
Inversely, if the angle DOC be a rt. ∠, then DC will be a tangent to the circle.

Questions in Mathematics and Natural Philosophy, proposed to the Senior Class, Agra College, and answers by Ameer Khan.

The paper contained a double set of questions; one for the First Division, the other for the Second. Ameer Khan, at the time of the examination, belonged to the *second*, but he had of his own accord read a considerable portion of the studies pursued in the first Division during the past year, and ventured to take up both sets the same day. His answers are inserted to show, that though competing at a disadvantage, his paper was not a bad one.

Question 1.—If a, b, c, be the angles which the resultant of three forces acting at rt. $\angle^s$ to one another make with each of them respectively, shew that $\cos 2a + \cos 2b + \cos 2c = -1$.

Answer.—Let AB, AC, AD, represent the three forces X, Y, Z, in direction and magnitude acting at rt. $\angle^s$ to one another at A. Complete the $\square^{ms.}$ BC, and FD, as represented in the figure, and join AE and AF, and let AF = R



$R^2 = AE^2 + AD^2 = AB^2 + AC^2 + AD^2$

$= X^2 + Y^2 + Z^2$; the figure is a rectangular parallelopiped, and R is the resultant of the three forces.

Let a = the $\angle$ made by R's direction with, -- -- -- AB

,, b = the $\angle$ -- -- -- -- -- -- -- -- -- AC

,, c = the $\angle$ -- -- -- -- -- -- -- -- -- AD

$$\therefore R \cos a = X \therefore \cos a = \frac{X}{R}$$

$$\text{Similarly } \cos b = \frac{Y}{R}$$

$$\text{and } \cos c = \frac{Z}{R}$$

$$\text{Hence } \cos^2 a = \frac{X^2}{R^2} \text{ and } 1 - \cos^2 a = \sin^2 a$$

$$= 1 - \frac{X^2}{R^2}$$

$$= \frac{R^2 - X^2}{R^2}$$

$$\text{Similarly sine}^2 b = \frac{R^2 - Y^2}{R^2}$$

$$\text{and sine}^2 c = \frac{R^2 - Z^2}{R^2}$$

$$\text{Now } \cos 2a = \cos^2 a - \sin^2 a$$

$$= \frac{X^2}{R^2} - \frac{R^2 - X^2}{R^2}$$

$$= \frac{2X^2 - R^2}{R^2}$$

$$\text{Similarly } \cos 2b = \frac{2Y^2 - R^2}{R^2}$$

$$\text{and } \cos 2c = \frac{2Z^2 - R^2}{R^2}$$

$$\therefore \cos 2a + \cos 2b + \cos 2c = \frac{2X^2 - R^2}{R^2} + \frac{2Y^2 - R^2}{R} + \frac{2Z^2 - R^2}{R^2}$$

$$= \frac{2X^2 + 2Y^2 + 2Z^2 - 3R^2}{R^2}$$

$$= \frac{2(X^2 + Y^2 + Z^2) - 3R^2}{R^2}$$

$$= \frac{2R^2 - 3R^2}{R^2}$$

$$= -\frac{R^2}{R^2} = -1$$

Q. 2.—Find the conditions of equilibrium of any number of forces acting on a point.

A.—Let $P\ P_1\ P_2\ P_3$ &c. ------ be the forces and

$\alpha\ \beta\ \gamma\ \delta$ &c. ------ the $\angle^s$ which their directions make with the axes.

$$\therefore P \cos \alpha = X, \quad P \cos \beta = Y, \quad P \cos \gamma = Z,$$

$$\text{Similarly } P_1 \cos \alpha_1 = X_1, \quad P_1 \cos \beta_1 = Y_1 \quad P_1 \cos \gamma_1 = Z_1$$

&c. = &c. and so on.

adding together those of the same denomination

$$P \cos \alpha + P_1 \cos \alpha_1 + P_2 \cos \alpha_2 + \cdots\cdots = \Sigma P \cos \alpha$$
$$= \Sigma X$$
$$P \cos \beta + P_1 \cos \beta_1 + P_2 \cos \beta_2 + \cdots\cdots = \Sigma P \cos \beta$$
$$= \Sigma Y$$
$$P \cos \gamma + P_1 \cos \gamma_1 + P_2 \cos \gamma_2 + \cdots\cdots = \Sigma P \cos \gamma$$
$$= \Sigma Z$$

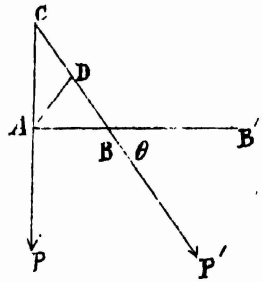
(the letter Σ (sigma) indicates their sum.)

$R^2 = \Sigma X^2 + \Sigma Y^2 + \Sigma Z^2$, but in case of equilibrium the resultant vanishes

$\therefore \Sigma X^2 + \Sigma Y^2 + \Sigma Z^2 = 0$. But a force acting perpendicularly in its own direction has no effect. Therefore these forces are independent of each other

$$\therefore \Sigma X = 0, \Sigma Y = 0, \Sigma Z = 0, R = 0$$

Q. 4.—Two equal forces act in a plane, one perpendicularly the other obliquely, and their effects are as 3 to 2. Find the inclination of the latter.

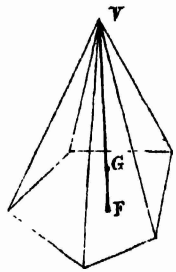


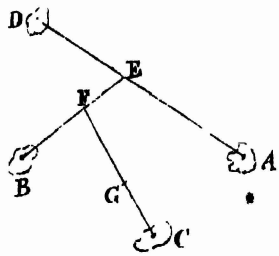
A.—Let A and B be the points of application of P and P_1 on the plane A B B′. Now the effect of the force is not altered if we apply it to any other point, provided it be in the same line. Let $\therefore$ C be the point where P and P_1 act. Draw AD perpendicular to CB. It is obvious

$$\text{that } AC : CD = P : P_1$$
$$= \text{sine } 90° : \text{sine DAC}$$
$$= \text{sine } 90° : \text{sine ABD}$$
$$= \text{sine } 90° : \text{sine } \theta$$
$$= 1 : \text{sine } \theta$$
$$= 3 : 2$$
$$\therefore \text{sine } \theta = \tfrac{2}{3}$$
$$\text{or } \theta = \text{sine}^{-1} \frac{2}{3}$$

Q. 5.—What is the "centre of parallel forces," and how is it found?

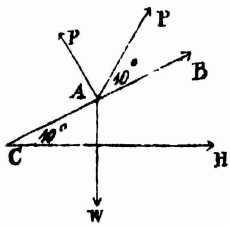
A.—The centre of parallel forces is the centre of gravity of any body which is acted on at every point in it by the attraction of the earth: and since the earth has a tendency to draw every body to its surface towards its own centre, and the directions of these forces are considered to be parallel to one another, for the centre of the globe lies at an immense distance, the centre of the forces is therefore called the "centre of parallel forces." This point is also called the "point of support," and may be found both theoretically and practically; the one by suspension, &c., and the former by the laws of mechanics. Thus the centre of gravity of an uniform rod, or beam, generally lies in the middle of it—that of a triangle at a distance of one-third from the middle of the base of the whole distance from that equal point to the vertex. That of a pyramid at G = a distance FG, to $\frac{1}{4}$ VF, F being the centre of gravity of the polygon which can be found by dividing the figure into triangles of a system of bodies. Thus first find the centre of gravity of A and B: join AB. Now supposing the bodies to be collected at their centres of gravity: find that of A and B and so on, until we arrive at G of the whole system.





Q. 6.—Find what weight may be sustained by a force of 10 lbs., on a plane whose inclination is 10°, acting at an angle of 10° with the plane.

A.—Let CB = the inclined plane.
Let CH = a horizontal line.
∠ ACH = 10°
∠ PAB = 10°
Let R = reaction.
Let P = force of 10 lbs.
Let W = weight sustained.



Resolving the forces in directions parallel to the plane.

$W \cdot \text{sine } CAW - P \cos PAB = o$, since there is equilibrium.

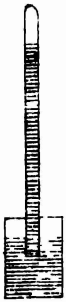
$\therefore W \text{ sine } 10^\circ = P \cos 10^\circ$ or $W = P\frac{\cos 10^\circ}{\text{sine } 10^\circ}$

or $W = P \cot 10^\circ$

$= 10 \text{ ℔} \times 1{\cdot}5671 = 15{\cdot}671 \text{ ℔s.}$

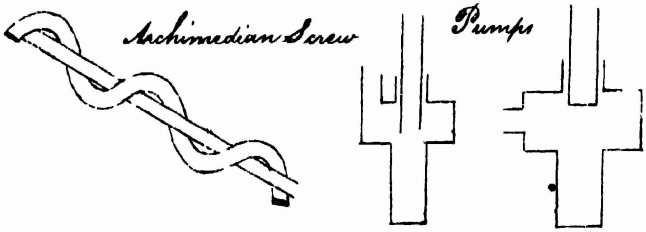
Q. 10.—Describe the construction and use of the Barometer.

A.—A long glass tube is first taken and hermetically sealed at one end. Mercury is then poured into it by the open end and the air expelled by heating the mercury. When there is no air left in the tube, it is turned into a cup or vessel also filled with the same fluid. The mercury descends into the cup and a vacuum is thus produced. The length of the column which remains, is from 28 to 29 inches. There are several kinds of Barometers, the common Barometer, the mountain Barometer, &c. &c. Its use is to measure the heights of mountains, &c. &c.



Q. 11.—Give a brief description of the machines in most ordinary use for raising water.

A.—The following are the machines for raising water: the Lifting pump, the Forcing pump, the Sucking pump, the Hydraulic belt, the Screw of Archimedes. Water is raised by the pumps by means of pistons and valves through the bores of the tubes. The Screw of Archimedes is a small wonderful instrument. The water seems to rise while it really descends. The Bucket is also a machine to raise water, also the Persian Wheel.



Q. 12.—Explain what is meant by "Latent heat."

A.—Latent heat means the concealed heat which remains in a body and does afterwards give itself out as in the case of ice. We know that ice becomes solid through the absence of heat: and is consequently very cold, but when it melts and turns into a liquid form, it is found to be cooler than in its solid state, and the reason of this is that at that time it gives out its latent heat which was formerly concealed in it.

Q. 22.—In any rt. ∠d triangle C being the right ∠

$$\cos 2A = \frac{b^2 - a^2}{b^2 + a^2}. \text{ Required proof.}$$

$$A.—\text{Cos } A = \frac{a^2 - b^2 - c^2}{2bc} \text{ but } c^2 = a^2 + b^2$$

$$\therefore \text{Cos } A = -\frac{2b^2}{2bc} = -\frac{b}{c} \therefore \cos^2 A = \frac{b^2}{c^2}$$

$$\text{Sine}^2 A = 1 - \cos^2 A = 1 - \frac{b^2}{c^2} = \frac{c^2 - b^2}{c^2}$$

$$\text{Cos } 2A = \cos^2 A - \text{sine}^2 A = \frac{b^2}{c^2} - \frac{c^2 - b^2}{c^2}$$

$$= \frac{2b^2 - c^2}{c^2}$$

$$= \frac{2b^2 - (b^2 + a^2)}{c^2}$$

$$= \frac{b^2 - a^2}{c^2}$$

$$= \frac{b^2 - a^2}{b^2 + a^2}$$

Q. 23.—In a plane triangle given two sides, 426 and 354, and the included angle 49° 16′. Find the other parts.

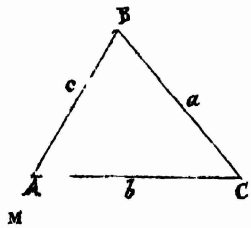
A.—Given $b = 354$

„ $c = 426$

„ $\angle A = 49° 16'$

$$a^2 = b^2 + c^2 - 2bc \cos A$$

$$\therefore a = \sqrt{b^2 + c^2 - 2bc \cos A}$$



Now $b^2 = 128316$: $c^2 = 181476$: $2bc = 301608$

Cos 49° 16′ = ·656052

$\therefore a = \sqrt{108635 \cdot 542}$

$= 329 \cdot 56$ nearly.

Again sine C = sine A. $\frac{c}{a}$ = sine A × 1·292

= ·97509824

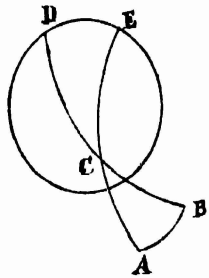
= sine 77° 14′ nearly

$\therefore$ C = 77° 14′

and $\therefore$ B = 53° 30′

Q. 24.—Having given the three angles of a spherical triangle, and the radius of the sphere, to find the area of the triangle.

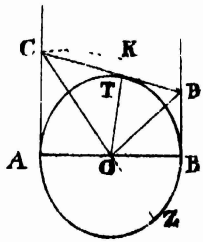
A. Given A, B, C and r to find the area of a spherical triangle.



The two triangles here represented are in every respect equal to one another, since their sides and angles are equal each to each. If we can find out the area of the △ CED that will be the area of the △ ABC. But the area of the △ CDE is found by taking away the areas of the lunes and the other remaining portions.

Thus area of ABC $= \frac{A + B + C - 180}{\pi} \pi r^2$ which are all given.

Q. 25.—Two parallel tangents AC, BD are drawn at the extremities of the diameter AB of a circle. From the centre O, any two straight lines OC, OD, containing a rt. ∠ being drawn to meet the parallel tangents in C and D, the line joining C and D will also be a tangent.



A.—The conditions given in the question are represented in the figure. If the line joining C and D, does not pass through a point touching the circle, let it lie as CKD. Make ∠ DOT = ∠ DOB.

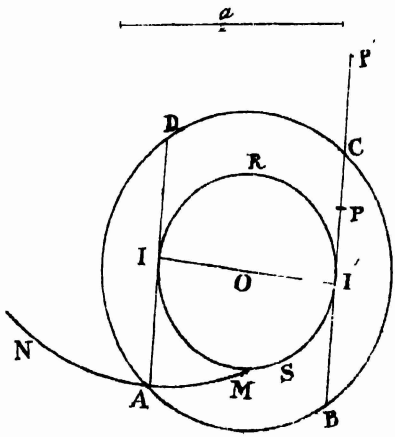
Join DT and CT. Then because BO = OT and OD is common to the two triangles, and the ∠ BOD = ∠ DOT ∴ DT = BD.

∴ ∠ DTO = 90°

Produce CO to Z. Then because TOD = DOB and COD = DOZ ∴ taking equals away, it follows that COT = BOZ, but BOZ = AOC ∴ COT = COA. Hence, the ∠ at T = 90°. Hence (13. Bk. 1) CTD is one right line. But CKD is also another right line, and they enclose a space: which is absurd ∴ CTD is the tangent to the circle.

Q. 26.—Place a straight line of given length in a given circle, making it pass through a given point either within or without the circle, and shew the limits.

A.—Let the point be within the circle as P, or without it as P′, and let the line of given length be represented by A, not greater than the diameter of the circle.

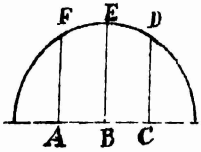


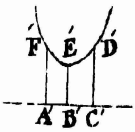
Take a point D in the circumference and from the centre D with a distance A, describe a circle NAM cutting the former in A ∴ DA = a. Draw OI perpendicular to DA from the centre O. With the centre O and distance OI, describe another circle RI¹S: and from P or P¹ draw a tangent to RI¹S, touching it at the point I¹. Join OI¹. Then because BC touches the circle and OI¹ meets it at I¹, OI¹B = OI¹C = 90°. Hence OI = OI¹ ∴ BC = 2CI¹, and the chords are equidistant from O, ∴ they are equal to one another, and ∴ BC = A. The given line must never exceed the diameter of the circle.

Second Division Paper containing 24 Questions.

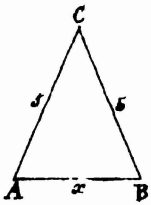
Q. 2.—Explain what is meant by a "maximum" and "minimum." Can there be more than one of each?

A.—Maximum means the greatest possible, and minimum the least possible. Here BE, drawn from the centre to the circumference is greater than all others, which can be drawn from the diameter to the circumference $\perp$ to the diameter, *i. e.*, BE $>$ CD $>$ AF, similarly in a Parabola $B^1E^1 \angle A^1F^1$ and $\angle C^1D^1$. The former is called a maximum, the latter a minimum.





Q. 8.—The radius of a circle being 5, determine the sides of the regular inscribed and circumscribed pentagon.



$$A.—x^2 = 5^2 + 5^2 - 2.5.5.\cos C$$
$$= 50 - 50.\cos C$$
$$\text{but } C = \tfrac{1}{5} \text{ of } 360^\circ$$
$$= 72^\circ$$
$$= 50 - 50.\cos 72^\circ$$

$$\text{or } \cos 72^\circ = \frac{50 - x^2}{50} \therefore \log\cos 72^\circ = \log\frac{50 - x^2}{50}$$
$$= \log y \text{ suppose}$$

$$\text{Now } \log\cos 72^\circ = 9{\cdot}489982 - 10$$
$$= \log {\cdot}3041$$
$$\therefore {\cdot}3041 = \frac{50 - x^2}{50}$$
$$= 1 - \frac{x^2}{50}$$
$$\therefore \frac{x^2}{50} = {\cdot}695900$$
$$\therefore x^2 = 50 \times {\cdot}695900 = 34{\cdot}795$$
$$\therefore x = \sqrt{34{\cdot}795} = 5{\cdot}9 \text{ nearly}$$

and for the circumscribed pentagon

$$x = 7{\cdot}4 \text{ nearly.}$$

Q. 11.—Prove that in any plane triangle tan A + tan B + tan C = tan A, tan B, tan C.

A.—Because $\tan(A + B + C) = \tan 180^\circ = 0$

$$= \frac{\tan A + \tan B + \tan C - \tan A, \tan B, \tan C}{1 + \tan A \tan B + \tan A \tan C + \tan B \tan C}$$

$= 0$

$\therefore$ multiplying by the denominator and transposing

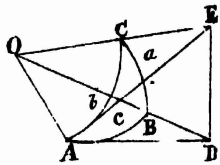
$\tan A + \tan B + \tan C = \tan A \tan B \tan C.$

Q. 12.—Prove that in a spherical triangle, A, B, C, being the angles, and a, b, c, the sides.

Cos a = cos b cos c + sine a, sine b, cos A.

And cos C = cosec A sine b cot c— cos b cot A.

A.—AD is $\perp$r to OA in the plane of AOB. AE is $\perp$r to OA in the plane of AOC



$\therefore DE^2 = AE^2 + AD^2 - 2AE.\ AD.\ \cos A$

$= OE^2 + OD^2 - 2OE.\ OD.\ \cos a$

$\therefore$ by equating and transposing

$OE^2 - AE^2 + OD^2 - AD^2 - 2OE\ OD.\ \cos a = -2\ AE.AD \cos A.$

or $2OA^2 - 2OE.\ ED.\ \cos a = -2AE.\ AD.\ \cos A.$

$\therefore OA.\ OA - OE.\ ED.\ \cos a = -AE.\ AD.\ \cos A$

Dividing by OE. OD

$\cos b.\ \cos c - \cos a = -\text{sine } b \text{ sine } c.\ \cos A$

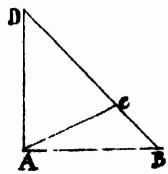
By transposition

$\cos a = \cos b \cos c + \text{sine } b.\ \text{sine } c.\ \cos A.$

Q. 14.—What is meant by "Spherical Excess."

A.—The area of a Spherical triangle, when the radius = 1, is $= A + B + C - 180^\circ$. The excess of $A + B + C$ (the angles of the spherical $\triangle$) over 180° is called the "Spherical Excess."

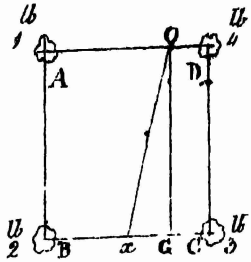
Q. 15.—Given the difference between the resultant and either of two equal forces acting at a rt. $\angle$, to determine the forces by a geometrical construction.



A.—Let CB be the given difference. At B, let an $\angle$ CBA be made equal to 45°. Produce BC, and let another angle be made at C, as ACD = to $67^\circ\ 30'$ and let CA meet BA in A. At the pt. A on the line AC construct an $\angle$ CAD = $\angle$ ACD. Then the $\angle$ at D = 45°. Hence the $\angle$ at A = 90°

Hence BD — AD = BD — DC = BC; and since AB, AD are the 2 equal forces acting at rt. ∠s to one another, the diagonal of the parallelogram or of the square here, will represent their resultant in direction and magnitude.

Q. 16.—Find the common centre of gravity of four bodies of 1, 2, 3, 4 lbs respectively placed at the angles of a square whose side is one foot.



A.—First find the centre of gravity of 1 and 4, and let it be at O. The bodies may be supposed to be collected at their centres of gravity. $\therefore 1 : 4 :: DO : AO$

$$\therefore \quad AO = \tfrac{4}{5} \text{ foot.}$$

$$\text{and } \therefore 5 : 4 :: 1 : AO$$

$$DO = \tfrac{1}{5} \text{ foot.}$$

So also for 2 and 3, take the point of gravity of 2 and 3 at x.

Now $2 : 3 :: Cx : xB$ and $5 : 3 :: 1 : Bx$

$$\therefore Bx = \tfrac{3}{5} \text{ foot and } cx = \tfrac{2}{5} \text{ foot.}$$

Bisect Cx in g and $\therefore OD = CG$

$\therefore OG = 1$ foot and is perpendicular to BC

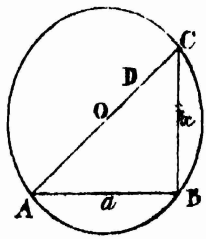
$$\therefore y^2 \text{ or } Ox^2 = 1 + \tfrac{1}{25} = \tfrac{26}{25}$$

$$\therefore y = \frac{\sqrt{26}}{5} = 1{\cdot}018 \text{ feet nearly.}$$

But since the weights $\overline{2+3}$ and $\overline{1+4}$ are equal to one another, therefore the centre of gravity of them, which may be supposed collected at those points of them respectively will be in the middle of Ox, that is at $\frac{1}{2} \times 1{\cdot}018$ or ·509 feet or 2·108 inches from x or from O. This is the centre of gravity of the 1, 2, 3 and 4 lbs.

Q. 17.—Two chords of a circle represent two forces, one of them being given, determine the other when the resultant is a maximum.

A.—Let AB = A, be the given force.
" x = the other unknown
" D = the diameter



We know that D is the maximum chord in the circle, and it can represent the diagonal of the parallelogram whose sides are a and x, or the resultant of a and x in direction and magnitude. We also know that an ∠ in a semicircle is = 90°

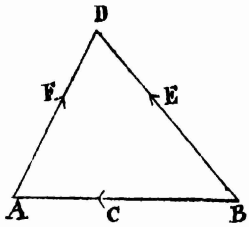
$\therefore D^2 = x^2 + a^2$

or $x^2 = D^2 - a^2$

$\therefore x = \sqrt{D^2 - a^2}$ which is known, for the circle is given, and so also the forces.

Q. 18.—Knowing the directions of three forces keeping each other at rest, how can we find their relative magnitudes?

A.—The three forces in equilibrium are BC, BE, and AF. Their directions are given as represented in the figure.



The rule is, that if a force which acting upon a body keeps it in equilibrium, be made to act at another point in the same line, the equilibrium will not be disturbed. Let the three forces be produced so as to meet one another forming a triangle. We know that if two forces be represented by the two sides, the third will represent the resultant, and thus the magnitude of the three forces are determined, when two of them represent the sides and the third the diagonal of the parallelogram, and keep each other in equilibrium.

Q. 19.—Describe "Atwood's Machine" and its uses.

A.—Atwood's machine consists of a brass graduated stand fixed upon a metallic block. It has a wheel upon its top, of which the axis is so smooth that friction there reaches ultimately to nothing. It has also two studs on the respective graduations of the stand. It is used to find out the velocity, time, space, &c., of bodies in motion. In this machine two equal weights are suspended (passing over a pulley), and when an extra weight was added to one of them it moved with an uniformly accelerated motion, and the following were the laws established by experiment. $V = 2st$, $s = \frac{gt^2}{2}$, also $V : V' :: T : T'$, also the spaces described in successive units of time are as the odd numbers.

Q. 20.—What is shown by the "Guinea and Feather" experiment?

A.—This experiment shows that it is only on account of the resistance of the air, that bodies of different dimensions and densi-

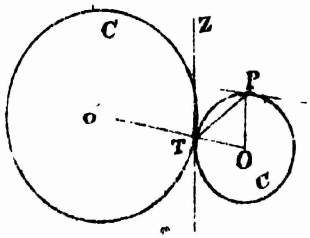
ties, have different velocities, but if there be a vacuum, *i. e.* if the air be extracted, they will fall from any the same height, on the same spot at the same time.

Q. 21.—What is meant by "conduction of heat?" Mention some illustrations of the different conducting powers of different substances, and the practical uses made of this knowledge.

A.—If we place two heated bodies near one another, the one being hotter than the other, in a short time we shall find them to be equally hot. In this case, the heat which was incessantly supplied from the more heated body to the less heated one is said to be conducted from the former to the latter. Black cloth is a bad conductor, and white a good conductor of heat.

Q. 23.—Describe a circle to touch a given circle, and also a given straight line in a given point, and show the limits.

A.—Let P be the given point and C the given circle. Draw PO perpendicular to the given line, and make the $\angle$TPO $= 45^\circ$, so that PT cuts the circle in T: from T draw TO perpendicular to PO, and TZ perpendicular to TO. $\therefore$ the angle PTZ $=$ the $\angle$ TPO in the alternate segment of the circle and TZ is a common tangent to the two circles, because OT can also be similarly proved to be perpendicular to TZ. Therefore, the circle C^1 drawn from the centre O, and a distance $=$ to OP, touches the given straight line at P and the given circle.



Questions in Waud's Analytical Geometry set to the Senior Class of the Delhie College and Answers by Mukhun Lall.

The questions marked with an asterisk were taken from the paper set by Government for the 1st and 2nd Divisions. Those not so marked were prepared by the Principal.

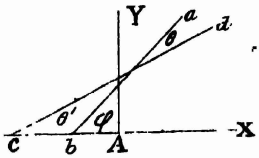
Paper on this subject containing seven questions.

*Q. 1.—What is meant by the equation to a line?

A.—By the equation to a line is meant the relation between its co-ordinates, in reference to any two axes, whether oblique or rectangular, expressed in figures.

*Q. 2.—Find the equation to a straight line parallel to a given straight line.

A.—Let $y = ax + b$ be the equation to a given straight line, and suppose $y = a^1x + b^1$ to be the $=^n$ to the parallel line, but as these lines are parallel to one another the $\angle^s$ which they make with the axis of X are equal: Hence the required equation is $y = ax + b^1$.

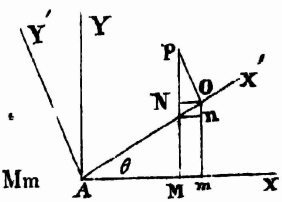


*Q. 3.—Find the equation to a straight line making a given $\angle$ with a given straight line.

Let ab be the given straight line and θ the given $\angle$. Now $\theta = \varphi - \theta'$ or $\theta' = \varphi - \theta$: consequently $\tan \theta' = \tan \alpha' = \frac{\tan \varphi - \tan \theta}{1 + \tan \varphi \tan \theta} = \frac{\alpha \beta -}{1 + \alpha \beta}$ (β is supposed to be the tangent to the $\angle\ \theta$). Therefore writing in the equation $y = \alpha' x + b'$ of the required line cd, $\frac{\alpha - \beta}{1 + \alpha \beta}$ for $\alpha,'$ the equation to that straight line becomes $y = \frac{\alpha + \beta}{1 + \alpha \beta} x + b'$

Q. 4.—Show how to transform co-ordinates from one rectangular system to another.

A.—Let AX, AY, be the original axes, and AX′, AY′, the new axes. Then AM = x



$= Am - Mm$

$= Am - NO$

$= x' \cos \theta - y' \text{ sine } \theta$

(for OPN = NOA = OAM = θ)

and $MP = y = MN + NP$

$$= OM + NP$$

$$= x' \text{ sine } \theta + y' \cos \theta$$

Hence the values of y and x have been found in terms of θ and of the co-ordinates in reference to the new system.

Q. 5.—Find the general Polar equation to the circle.

A. The general equation to the circle is $a^2 = (y - y') + (x - x')^2$, or $y^2 + x^2 - 2(yy' + xx') + y'^2 + x'^2 - a^2 = 0$

$$\left.\begin{array}{r}\text{Substitute } \alpha + r \cos \theta \text{ for } x \\ \text{and } \beta + r \text{ sine } \theta \text{ for } y\end{array}\right\} \text{in this equation,}$$

then we have

$$(\beta + r \text{ sine } \theta)^2 + (\alpha + r \cos \theta)^2 - 2y'(\beta + r \text{ sine } \theta) - 2x'(\alpha + r \cos \theta) + y'^2 + x'^2 - a^2 = 0$$

or $\beta^2 + 2r\beta \text{ sine } \theta + r^2 \text{ sine}^2 \theta + \alpha^2 + 2r\alpha \cos \theta + r^2 \cos^2 \theta - 2y'\beta - 2ry' \text{ sine } \theta - 2x'\alpha - 2rx' \cos \theta + y'^2 + x'^2 - a^2 = 0$

or $r^2 (\text{sine}^2 \theta + \cos^2 \theta) + 2(\beta \text{ sine } \theta + \alpha \cos \theta - y' \text{ sine } \theta - x' \cos \theta) r - 2y^1 \beta - 2x^1 \alpha + \beta^2 + \alpha^2 + y^{12} + x^{12} - a^2 = 0$

$$\text{or } r^2 + 2\left\{(\beta - y') \text{ sine } \theta + (\alpha - x^1) \cos \theta\right\} r - 2(y^1\beta + x^1\alpha) + \beta^2 + \alpha^2 + y^{12} + x^{12} - a^2 = 0.$$

Q. 6.—Transform the equation $(ay^2 + bxy + cx^2 + f = o$ into one which shall want the rectangle (x.y.), the co-ordinates being supposed rectangular.

A.—$y = x^1 \text{ sine } \theta + y^1 \cos \theta$

and $x = x^1 \cos \theta - y^1 \text{ sine } \theta$

substituting these values of y and x in the given equation, we get

$a(x^1 \sin \theta + y^1 \cos \theta)^2 + b(x^1 \sin \theta + y^1 \cos \theta)(x^1 \cos \theta - y^1 \sin \theta) + c(x^1 \cos \theta - y^1 \sin \theta)^2 + f = 0.$

Expanding, we get

$$a(\cos^2 \theta - b \sin \theta \cos \theta + c \sin^2 \theta) y^{12} + \left\{(a - c) 2 \sin \theta \cos \theta + b(\cos^2 \theta - \sin^2 \theta)\right\} x^1 y^1 + (a \sin^2 \theta + b \sin \theta \cos \theta + C \cos^2 \theta) x'^2 + f = 0$$

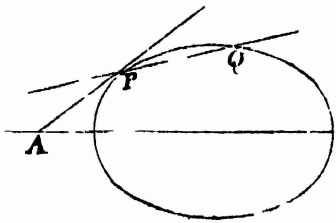
or $(a - c) \sin 2\theta + b \cos 2\theta = \theta$

$$\therefore \tan 2\theta = \frac{-b}{a-c}$$

Hence if the co-ordinates be transferred at such an angle (θ) tha $\tan 2\theta = \frac{-b}{a-c}$, the equation so transferred shall not contain the product (x.y). But, because a tangent to an $\angle$ varies from 0 to ∞, whatever be the values of b, a and c, there will always be a possible value for θ. Consequently, there is an infinite number of such axes, to which, if the equation be referred, it will not contain the product (x.y).

*Q. 7.—Find the equation to the tangent to an ellipse at any point.

A.—Draw PQ, a line cutting the ellipse in the points P and Q. Let the co-ordinates of P be x', y': and those of Q be x'' y'', then the equation to the line PQ is



$$y - y' = \frac{y' - y''}{x' - x''}(x - x') \quad \text{-- -- -- -- -- -- --} \quad (1)$$

The equation to the ellipse for the point P is

$$a^2 y'^2 + b^2 x'^2 = a^2 b^2, \text{-- -- -- -- -- -- -- -- --} \quad (2)$$

The equation to the same for the point Q is

$$a^2 y''^2 + b^2 x''^2 = a^2 b^2, \text{-- -- -- -- -- -- -- -- --} \quad (3)$$

Subtracting equation (3) from equation (2) we get,

$$a^2 (y'^2 - y''^2) + b^2 (x'^2 - x''^2) = 0$$

$$\therefore a^2 (y' - y'')(y' + y'') + b^2 (x' - x'')(x' + x'') = 0$$

$$\therefore \frac{y' - y''}{x' - x''} = -\frac{b^2}{a^2} \cdot \frac{x' + x''}{y' + y''}:$$

substituting this value of $\frac{y' - y''}{x' - x''}$ in equation (1), the equation to the secant PQ becomes

$$y - y' = -\frac{b^2}{a^2} \frac{x' + x''}{y' + y''}(x - x').$$

So that when Q coincides with P, or $y'' = y'$ and $x'' = x'$, then it becomes the tangent to the ellipse at the point P.

Therefore making $y'' = y'$ and $x'' = y'$, the equation to the tangent at P, or to PA is

$$y - y' = -\frac{b^2}{a^2}\frac{x'}{y'}(x - x').$$

Questions in Brinkley's Astronomy put to the Senior Class, Dehlie College, and Answers by Mukkhun Lall.

[The foregoing remark applies equally to the following.]

*Q. 1.—Explain the astronomical terms, "right ascension," "declination," "circle of altitude," "first point of Aries," "Precession of Equinoxes."

A.—The "right ascension" of a star is the arc of the equator intercepted between the first point of Aries and a secondary to the equator passing through the star, the degrees to be reckoned in the order of the signs.

The "declination" of a star is the number of degrees contained in the arc of the secondary to the equator intercepted between the object and the equator. The declination is north or south according as the star is situated to the north or south of the equator.

That secondary to the horizon which passes through any object in the heavens and the zenith, is called the "circle of altitude," because the height or altitude of that object is taken on that circle. The commencement of the first degree of that sign of the zodiac which is called Aries, reckoned on the equator is called the "first point of Aries," and it is there that the ecliptic and equator intersect one another.

The points in the equator where the equator cuts the ecliptic, continually vary, and have a retrograde motion, *i. e.* are contrary to the order of the signs—also the Sun, before he completes his annual path in the ecliptic, enters these equinoxes, which are therefore said to "precede" the Sun. Hence the retrograde motion of the equinoxes is called the "precession of the equinoxes."

*Q. 2.—In latitude 60° N., what are the altitudes at the superior and inferior transit of a star whose declination is 46° N.?

A.—As the height of the pole above the horizon is equal to the latitude of the place, the place having 60° N. latitude will have the pole elevated 60° above its horizon. And the star whose declination is 40° north will be from the pole at a distance equal to the complement of the declination, *i. e.* 50° from the pole. Hence the altitude of that star above the horizon will be, at the superior transit, equal to 60° + 50° = 110° from the north or 70° from the south, and at the inferior transit equal to 60° — 50° or 10° from the north.

*Q. 3.—State the arguments adduced to prove the revolution of the earth upon its axis.

A.—First argument. From analogy. The discoveries made in Astronomy by means of the Telescope have proved beyond all controversy that the Sun, Planets, and their Satellites revolve on their axes in different times. The spots on the Sun, and various marks on the disc of the Moon, Jupiter, &c., prove incontestibly this phenomenon. And as the Earth is also in the Planetary system, it is natural to suppose that the Earth revolves on its axis, instead of supposing that all the heavenly bodies, though some nearly at an infinite distance, move round the Earth in 23 hours 56 minutes, which is almost incredible, for the cohesion of the particles of any substance on the Earth cannot resist such an immense velocity. Again, it is a law of Nature that a circular motion requires two forces to keep a body in the same path, *i. e.* a centrifugal and a centripetal force. Now, where can we conceive such a force to be placed on the Earth, as to keep all the heavenly bodies in their proper spheres? The Earth itself cannot be such an attracting body; for it is much smaller than the Sun alone, and inconceivably smaller than the sum of all the heavenly bodies put together.

Terrestrial phenomena also, such as currents in the ocean, and the protuberance at the equator, and depression at the poles, favour the supposition that the Earth revolves on its axis.

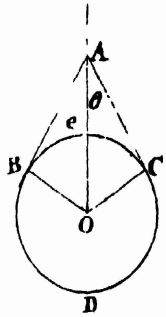
Besides, it is known by experience, that when a thing in nature can be performed by simple means, they have been adopted by nature in lieu of the complicated ones. Hence it is necessary that the Earth should revolve on its axis, because this complicated daily phenomenon, *i. e.* the revolution of all the heavenly bodies, is easily accounted for by this hypothesis.

The revolution of the earth on its axis has also been proved by experiments. Thus the velocity at some distance from the Earth is greater than that at the surface; also bodies let fall from a height, do not fall perpendicularly to the surface of the earth, but a little to the east of the point, which proves the existence of motion in the Earth.

*Q. 4.—Explain the method employed for determining the dimensions of the Earth.

A.—The number of degrees passed on the Earth by a person from the equator towards the pole is = to the number of degrees in the altitude of the pole, and as many degrees as he goes towards the pole, the same number of degrees is added to the former altitude of the pole. Hence knowing that as much distance passed on the earth from the equator towards the pole will be equal to one degree on the earth, men have repeatedly measured these distances by means of a long line, and knowing the number of degrees contained in a circle, the product of the number of degrees in a circle into the measured distance of one degree gives the circumference of the circle.

There is another trigonometrical method of determining the dimensions of the Earth.



Let BCD represent the section of the Earth.

Let Ae = a, be some height from the surface, which can be known by actual measurement.

Let ∠OAC θ, = be the angle known by observation: consequently Oe or the radius of the earth is known.

For, putting Oe = x.

$$\text{Sine OAC} = \sin\theta = \frac{OC}{OA} = \frac{x}{x+a}$$

$$\therefore x \sin\theta + a \sin\theta = x$$

$$\text{or } x(1 - \sin\theta) = a, \sin\theta$$

$$\therefore x = \frac{a \sin\theta}{1 - \sin\theta}$$

Q. 5.—What is the measure of a degree on the Earth's surface, and how is it determined?

A.—The measure of a degree on the Earth's surface, is 69½ British miles nearly, and it is determined by the method given in the answer to the fourth question.

Q. 6.—Explain fully how the change of seasons is occasioned, and likewise the precession of the equinoxes.

A.—The change of seasons is occasioned by the revolution of the Earth round the Sun, and the inclination of the Earth's axis to the plane of the earth's orbit at an angle of $66\frac{1}{2}^{\circ}$ nearly. For, had the axis remained perpendicular to the orbit, the Sun would always be vertically on the equator, and consequently no change of seasons would be effected. Now as the axis is inclined, and, owing to the daily revolution of the earth, remains always parallel to itself, it is in one part of its orbit, while facing the Sun, inclined towards the Sun at an angle of $90^{\circ} - 23\frac{1}{2}^{\circ}$ or $66\frac{1}{2}^{\circ}$, or the Sun would appear in Cancer, for the angle which the axis of the earth makes with the line joining the centre and the point in Cancer is also equal to $66\frac{1}{2}^{\circ}$. Hence this line will coincide with the plane of the Earth's orbit. But when the earth comes to that part of its orbit, which is just opposite to the other place, the axis will be inclined away from the Sun, and consequently the angle towards the Sun will be equal to $180^{\circ} - 66\frac{1}{2}^{\circ}$ or $113\frac{1}{2}^{\circ}$ or $90^{\circ} + 23\frac{1}{2}^{\circ}$, which is equal to the angle the axis makes with a line joining the centre and a point in Capricorn. Consequently, this line will coincide with the plane of the orbit, or the Sun will be seen in Capricorn, because he is situated in the plane of the orbit. But in quadrature, the plane of the axis being perpendicular to the orbit, the line joining the centre and the equinoxial point will coincide with the orbit, and consequently the Sun will be seen on the equator.

The amount of the precession of the equinoxes is 1° in 72 years or $50{\cdot}2''$ annually. The earth being in perihelion or aphelion, the protuberance on the equator is below or above the plane of the earth's orbit; but being at the same time attracted by the Sun, the protuberance on the earth becomes less inclined from the plane of the orbit, and consequently before the earth comes exactly in quadrature, the protuberance on the equator coincides, or the Sun comes on the equator before he has completed one path in his orbit. Hence the precession of the equinoxes.

Questions in Herschell's Discourse on Natural Philosophy set to the Senior Class, Delhi College, and answers by Mukkhun Lall.

[The foregoing remark applies equally to the following.]

*Q. 1.—What do you mean by the analysis of complex phenomena? Give an illustration.

A.—By the analysis of a complex phenomenon is meant to trace it to its ultimate laws, or in other words, to find what those relations in nature are, on which the phenomenon ultimately depends, and which led to the production of it.

Let us take an instance of sound. We see that it comprises two facts: the production and the sensation of sound. The first depends on the vibrating motion of the strings of the instrument which caused that sound: and the latter on the communication of motion from the string to the surrounding air, and thence from particle to particle until it is transmitted to the ear. From the ear it is communicated to the auditory nerve which produces sensation, and thence to the brain, where it is as it were perceived by the mind.

*Q. 2.—What is the object of collecting numerous facts? and what is necessary in order that such collections may be of any value to science?

A.—The object of collecting numerous facts is to make a correct induction. For when the facts are few, it is possible that the similarity or relation which exists between them may be accidental, and not permanent. It is possible that sneezing may be followed once or twice by an unsuccessful undertaking, but we should not conclude from this that sneezing and an unsuccessful undertaking are inseparably connected together as cause and effect: for try the experiment once more, and you will find the relation was not a necessary one. Hence, it is necessary that numerous facts should be collected. Even contrary facts should be taken into consideration, for then we will be quite sure that the circumstance which is common to the collected facts, must be the cause or concomitant effect of a common cause. In order that these collections may be of any value to science, we must always consider two things. *First.* They must be carefully attended to, while they are produced, that no attendant circumstance be left out. For then we are liable to make a wrong induction. For instance, the fall of a meteor is attended with a flash of lightning and a rattling noise; from which some considered the phenomenon of a falling meteor and that of a thunder-storm to be of one and the same sort. Had they attended to this circumstance that even a single patch of cloud in a clean sky is sometimes attended by a rattling noise and a flash of lightning, they would not have drawn such a hasty conclusion. *Second.* That such collections should be put down in precise and intelligible terms; for we may misconceive the real fact. For instance, should it be told to a person ignorant of the phenomenon of lightning, that lightning struck a wall and afterwards made a rebound, he would certainly conceive lightning to be a solid body.

Q. 3.—How is the notion of a law of nature acquired? why is a knowledge of such laws of the greatest importance to man?

A.—The notion of a law of nature is acquired by experience and by an inward process of the mind. Experience is of two sorts: Passive or observation, and active or experiment. We have seen by observation that a body in the air and unsupported by any thing, falls to the ground. This has been known by observation. But if, in order to try whether a similar case will happen again under similar circumstances, we lift up a body and then let it fall from the hand, it is called an *experiment*. Hence by these means we come to the knowledge of the law of nature called the law of gravitation.

It is to the knowledge of such laws that man is indebted for all the conveniences, nay even for the maintenance of his life. It is owing to the law of nature that fire burns wood when the latter comes in contact with the former, that man is supplied with cooked food.

Q. 4.—Define art. When is it denominated "Empirical" and when "Scientific?" and what are the means for perfecting arts?

A.—Art is the application of scientific results to the practical purposes of life. When a theory, being hastily formed from a few instances, is brought into practice, such an art is called "Empirical;" but when the result has been obtained from numerous instances and examined many times, then it is denominated a "Scientific Art." In order to bring an art to perfection, it is necessary that it be made to bear a close connexion with science, and its deficiencies should be supplied from them. Thus dyeing is not made perfect, unless it borrow, in a great measure, aid from chemistry.

Q. 5.—What is a "Crucial Instance?" give an example of it.

A.—When two theories run parallel to each other, and are equally supported by the collected facts, it often happens that a single instance is sufficient to dispel this doubt, and enables us to lean towards one theory and nullify the other. Such an instance is denominated by Bacon a "crucial" instance. For instance, some suppose that colour is an essential quality of matter, while others, that it is produced only by the vibrations of the particles at the surface of the coloured body, and is consequently one of the secondary qualities of the body. These two theories are equally supported by many instances. But if a ray of light be made to pass through a prism, and let fall on any coloured surface, the seven colours of the ray of light will not mix with the colour of the surface, but will be as distinct as if they were on a white surface. Hence the theory that colour is *not* an essential quality of matter is verified by this single instance.

DEHLIE.

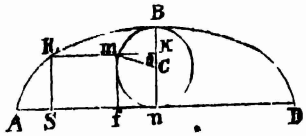
Questions in the Differential Calculus set to the Senior Class of the Dehlie College, and Answers by Radha Kishen.

[Of the following questions, those marked with an asterisk were taken from the paper set by Government. Those not so marked were proposed by the Principal.]

Paper on this subject containing 7 Questions.

Question 1.—Find the equation to the cycloid, the vertex being the origin.

Answer.—Let ABD be the cycloid generated by the circle Bmn.



Now by the property of this curve An = arc Bmn = π

and AS = fn

Suppose BK = x and KR = y

$\therefore$ x = BK = CB — CK = a — a cos θ

(where a = radius of the circle Bmn and

θ = $\angle$ mcB at the centre c)

and y = RK = An — AS = An — fn

= An — mk

= π — a sine θ

Hence the point R on the cycloid will be determined by the equations.

$$x = a - a \cos \theta \text{ and } y = \pi - a \sin \theta.$$

Q. 2.—Draw the assymptote to the curve

$$y^3 = x^3 + ax^2$$

A.— $$y^3 = x^3 + ax^2 = x^3\left(1 + \frac{a}{x}\right).$$

$$\therefore y = x\left(1 + \frac{a}{x}\right)^{\frac{1}{3}}$$

$$\text{or, } y = x\left\{1 + \tfrac{1}{3}\frac{a}{x} + \frac{\frac{1}{3}(\frac{1}{3}-1)}{1\cdot 2}\frac{a^2}{x^2} + \frac{\frac{1}{3}(\frac{1}{3}-1)(\frac{1}{3}-2)}{1\cdot 2\cdot 3}\frac{a^3}{x^3} + \&c.\right\}$$

$$= x\left\{1 + \tfrac{1}{3}\frac{a}{x} - \frac{\frac{1}{3}\cdot\frac{2}{3}\cdot a^2}{1.2\,x^2} + \&c.\right\}$$

$$= x + \frac{a}{3} - \frac{\frac{1}{3}\,\frac{2}{3}\,a^2}{1\cdot 2\,x^2} + \&c.\cdots$$

or rather, suppose after substitution,

$$y = x + \frac{a}{3} - \frac{A}{x} + \frac{B}{x^2} - \frac{C}{x^3} + \&c.$$

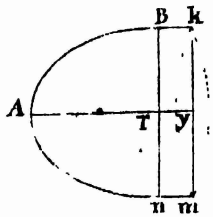
whence it appears that

$y' = x + \frac{a}{3}$ is the equation of the assymptote required. It makes an $\angle$ of 45^0 with the axis of x, and cuts the axis of y at $\frac{a}{3}$ distant from the origin.

Q. 3.—If V be the volume of a solid of Revolution, then

$$\frac{dv}{dx} = \pi y^2$$

A.—Let nAB be the volume of a solid of revolution, upon which add a very small increment nk, which may be expressed by dv. It is evident that ry = dx, which is the increment on the axis Ar. And now it is obvious that the increment nk or $dv \doteq \pi y.^2 dx$, for y being the radius of the circle km, its area is $= \pi y^2$, and this being multiplied into dx will be ultimately $\pi y^2\, dx = dv$ or



$$\frac{dv}{dx} = \pi y^2$$

Q. 4.—Define the radius of curvature, and find its value in terms of $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$

A.—The radius of curvature is that by which the curvature of a given curve is found, for the curvature varies as $\frac{1}{\text{rad of curv.}}$. It is the radius of a circle, the centre of which forms an evolute, while the other end of this forms an involute.

It is evident that the equation to the circle is

$$R^2 = (x - \alpha)^2 + (y - \beta)^2 \quad \text{------}(1)$$

differentiating

$$0 = (x - \alpha) + (y - \beta)\frac{dy}{dx} \quad \text{------}(2)$$

differentiating again

$$0 = 1 + (y - \beta)\frac{d^2y}{dx^2} + \frac{dy^2}{dx^2} \quad \text{----}(3)$$

from equation (2),

$$x - a = -(y - \beta)\frac{dy}{dx}$$

substituting this in equation (1),

$$R^2 = (y - \beta)^2 \left\{1 + \frac{dy^2}{dx^2}\right\}^2 \quad \text{-- --} \quad (4)$$

from (3) we have

$$(y - \beta)^2 = \frac{\left(1 + \frac{dy^2}{dx^2}\right)^2}{\left(\frac{d^2y}{dx^2}\right)^2}$$

substituting this value of $(y - \beta)^2$ in (4)

we have

$$R^2 = \frac{\left(1 + \frac{dy^2}{dx^2}\right)^2}{\left(\frac{d^2y}{dx^2}\right)^2}\left(1 + \frac{dy^2}{dx^2}\right)$$

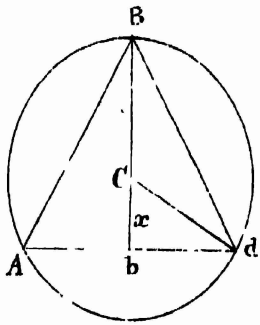
$$= \frac{\left(1 + \frac{dy^2}{dx^2}\right)^3}{\left(\frac{d^2y}{dx^2}\right)^2}$$

$$\therefore R = \pm\frac{\left(1 + \frac{dy^2}{dx^2}\right)^{\frac{3}{2}}}{\left(\frac{d^2y}{dx^2}\right)}$$

If the radius be considered positive, while the curve is concave, or $\frac{d^2y}{dx^2}$ is negative, and if on the contrary, the curve being convex, *i. e.* $\frac{d^2y}{dx^2}$ being positive, the radius be reckoned negative, we shall always have

$$R = -\frac{\left(1 + \frac{dy^2}{dx^2}\right)^{\frac{3}{2}}}{\frac{d^2y}{dx^2}}$$

*Q. 6.—Inscribe the greatest isosceles triangle in a circle.



A.—Suppose ABD to be a given circle whose centre is C and radius $= a$. Let ABD be the isosceles triangle and $AB = Bd$. Now it is obvious that a perpendicular drawn from the vertex B will necessarily pass into the centre C.

Assume $fc = x$

then $fd = \sqrt{cd^2 - cf^2}$

$= \sqrt{a^2 - x^2}$

But area of $\triangle ABd = fB \times fd$

$= (x + a)\sqrt{a^2 - x^2}$

Let this $= u$

$$\therefore u = (x + a)\sqrt{a^2 - x^2} \quad \text{-- -- -- -- --} \quad (1)$$

$$\frac{du}{dx} = \sqrt{a^2 - x^2} - \frac{(x + a)\,u}{\sqrt{a^2 - x^2}} = 0, \text{ by}$$

the rules of maxima and minima.

$$\therefore a^2 - x^2 - x^2 - ax = 0$$

$$\text{or } 2x^2 + ax = a^2$$

$$\therefore x^2 + \frac{a}{2}x + \frac{a^2}{4} = \frac{a^2}{2} + \frac{a^2}{4} = \frac{3a^2}{4}$$

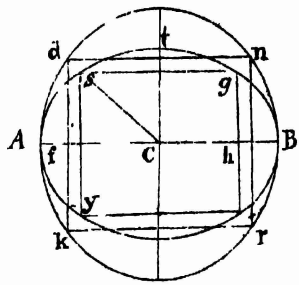
$$\therefore x + \frac{a}{2} = \pm a \frac{\sqrt{3}}{2}$$

$$\therefore x = -\frac{a}{2} \pm \frac{a}{2}\sqrt{3}$$

$$= \frac{a}{2}\left(-1 \pm \sqrt{3}\right)$$

by substituting this value of x in eqn. (1) we shall have the greatest area of the $\triangle$ required, and also after substituting the value of x, it will appear that $\frac{d^2u}{dx^2}$ is a negative quantity, which denotes that the value of x determined above is such that the $\triangle$ required becomes the greatest possible.

*Q. 7.—An ellipse and a circle being described on the same axis major, find the ratio between the greatest inscribed rectangles.



A.—Suppose AgB to be the ellipse and AdnBK the circle described on the same major axis, Suppose AB = a.

Let Ct = b

Ch = x

Then by the equation of the ellipse

$$y = \frac{b}{a}\sqrt{a^2 - x^2}$$

$$\therefore \text{the rectangle } yg = 2x \times 2\,\frac{b}{a}\sqrt{a^2 - x^2}$$

$$= 4\,\frac{b}{a}\,x\,\sqrt{a^2 - x^2}$$

$$= u \text{ suppose.}$$

Take away $\frac{4b}{a}$ a constant which will not introduce any change in the value of the rectangle.

$$\therefore u = x\sqrt{a^2 - x^2}$$

diffg. $$\frac{du}{dx} = \sqrt{a^2 - x^2} - \frac{x^2}{\sqrt{a^2 - x^2}} = 0$$

$$\therefore a^2 - x^2 - x^2 = 0$$

$$\text{or } 2x^2 = a^2 \therefore x = \frac{a}{\sqrt{2}}.$$

$$\text{or } 2x = \frac{2a}{\sqrt{2}} = \sqrt{2}\,a. \text{ and } y = \frac{b}{a}\sqrt{a^2 - x^2}$$

Substituting

$$y = \frac{b}{a}\sqrt{a^2 - \frac{a^2}{2}}$$

$$= \frac{b}{a} \times \frac{a}{\sqrt{2}} = \frac{b}{\sqrt{2}}$$

therefore u or the area of the rectangle gy = 2 ab. -- -- -- (1)

Now, in the case of the circle Anb, let cf = β.

$$\therefore fd = \sqrt{dc^2 - fc^2}$$

$$= \sqrt{\alpha^2 - \beta^2}$$

Therefore the rectangle kn inscribed in the circle $= 2\sqrt{a^2 - \beta^2} \times 2\beta$

$$= 4\beta\sqrt{a^2 - \beta^2}$$

$$= v \text{ suppose}$$

$\therefore v = 4\beta\sqrt{\alpha^2 - \beta^2}$. Take away the constant 4.

$$v = \beta\sqrt{\alpha^2 - \beta^2}$$

$$\frac{dv}{d\beta} = \sqrt{\alpha^2 - \beta^2} - \frac{\beta^2}{\sqrt{\alpha^2 - \beta^2}} = 0$$

$$\therefore \alpha^2 - \beta^2 - \beta^2 = 0$$

$$\therefore 2\beta^2 = \alpha^2 \quad \therefore \beta = \frac{\alpha}{\sqrt{2}}$$

$$\text{where } fd = \sqrt{\alpha^2 - \beta^2}$$

$$= \sqrt{\alpha^2 - \frac{\alpha^2}{2}}$$

$$= \frac{\alpha}{\sqrt{2}}$$

Hence rectangle $kn = \frac{4\alpha^2}{2} = 2\alpha^2$ ---------- (2)

From equations (1) and (2), we shall have the following ratio between the greatest rectangles kn and gy.

$$\square\, kn : \square\, gy :: 2a^2 : 2\,ab.$$
$$:: a : b.$$

Questions in Dynamics proposed to the Senior Class, Dehlie College, and answers by Radha Kishen.

[The entire paper was prepared by the Principal, none of the Government questions on this subject were set.]

Q. 1.—In uniformly accelerating forces from rest prove the formula $\int = \frac{ft^2}{2}$. If a body be projected with a velocity of 100 feet per second, and be subject to the uniformly accelerating force of 32 feet, what space will it descend in 4″?

A.—Suppose that a space s is described with a velocity v in time t by an uniformly accelerating force. Divide the time t into n intervals each, equal to $\frac{t}{n}$. Hence the velocity in each interval $= \frac{v}{n}$. Now the space described with the final velocity of each interval acting uniformly through it $= \frac{vt}{n^2} + \frac{2vt}{n^2} + \frac{3vt}{n^2} + \text{------} \frac{nvt}{n^2}$ as may be proved by the rule of Arithmetical series, and the space described by the initial velocity of each interval is

$$= 0 + \frac{vt}{n^2} + \frac{2vt}{n^2} + \text{----------} + \frac{(n-1)\,vt}{n^2}$$

$$= \frac{vt}{2}\left(1 - \frac{1}{n}\right)$$

and since the space s is described by the intermediate velocity of these, therefore in the limit, *i. e.* when $n = \infty$, $s = \frac{vt}{2}$.

But $v = ft \therefore s = \frac{ft^2}{2}$

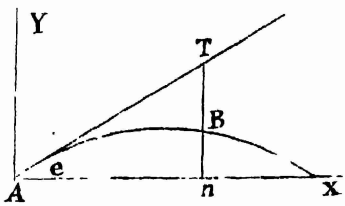
But it is proved by accurate experiments that a body in the latitude of London falls 16 feet in a second, and we have just proved that the spaces vary as the squares of the times. $\therefore$ if we suppose $\frac{1}{2}g = 16$ feet we have $1'' : t''^2 :: \frac{g}{2} : \frac{gt^2}{2} = S$, and when a body is projected by the velocity w, the space it describes in time t is tw. Therefore by the compound effect of the force of gravity and of the projectile we have $s = wt. \pm \frac{1}{2} gt^2$. The upper sign is used when a body is acted upon by an uniformly accelerating force, and the latter when it is acted upon by a retarding force. In the present example

$$w = 100 \text{ feet}, t = 4'', \text{ and } \tfrac{1}{2}g = 16 \text{ feet}$$
$$\therefore s = 100 \times 4 \pm 16 \times 16$$
$$= 400 \pm 256$$
$$= 656 \text{ or } 144 \text{ feet.}$$

The former result will apply to an accelerating the latter to a retarding force. I have comprehended by the example that the body is projected vertically upwards or downwards.

Q. 2.—A body is projected in a direction making an $\angle$ of 30° with the horizon with a velocity of 100 feet per second. Find the equation to the path, and its range upon a horizontal plane.

A.—Suppose a body to be projected with a velocity of 100 feet per second in the direction AT making an angle TAX = 30° with the horizontal plane AX. It is evident that a body projected in this direction AT.



with the velocity v, and at the same time continually drawn in a vertical direction, will take a curvelinear path, such as ABX. It is required

to determine the equation to this curve. Suppose A to be the origin of rectangular axes AX and AY.

Let $An = x$ and $nB = y$

It is evident that $AT = vt$

and $TB = \frac{1}{2} gt^2$

assume $TAX = e^{\circ}$

$\therefore y = Bn = Tn - TB$

$= x \tan e - \frac{1}{2} gt^2$ ---- ---- ---- ---- (1)

But $x = AT. \cos e$

$= tv. \cos e$ whence $t = \dfrac{x}{v \cos e}$

substituting this value of t in (1)

we have $y = x \tan e - \dfrac{gx^2}{2v^2 \cos^2 e}$

$= x \tan e - \dfrac{gx^2}{2v^2} \operatorname{Sec}^2 e$ -- ---- ---- (2)

which is evidently the equation to a parabola.

If we use oblique co-ordinates and suppose AT the ordinate y and BT x, in that case we have

$$TB = x = \tfrac{1}{2} gt^2$$

and $AT = y = tv = t\sqrt{2ag}$ representing the height due for projectile velocity.

Hence from the latter equation we have $t = \dfrac{y}{\sqrt{2ag}} \therefore t^2 = \dfrac{y^2}{2ag}$

substituting this in the former equation we have

$$x = \tfrac{1}{2} gt^2 = \tfrac{1}{2} g. \frac{y^2}{2ag}$$

$$= \frac{y^2}{4a}$$

Hence $y^2 = 4ax$ which is the equation to the parabola. Hence it is proved that the curve generated by a projected body making an $\angle$ e with the horizon is a parabola.

Suppose y to be made o in equation (1), we shall find a value of x that will give the value (of AX) of the range required, when we shall substitute the values of v and e in it.

$$\text{Thus } o = x \tan e - \frac{gx^2}{2v^2} \operatorname{Sec}^2 e$$

$$\text{or } gx^2 \operatorname{Sec}^2 e = 2v^2 \tan e \times x$$

$$\text{or } x = \frac{2v^2 \tan e \cdot \cos^2 e}{g}$$

$$= \frac{2v^2 \text{ sine } e \,.\, \cos e}{g}$$

$$= \frac{v^2}{g} \text{ sine } 2e$$

But $e = 30^\circ$ and $v = 100$ feet and $g = 32$ feet nearly

$$\therefore x = R = \text{range required} = \frac{10000}{32} \,.\, \text{sine } 60^\circ$$

$$= \frac{10000}{32} \frac{\sqrt{3}}{2}$$

$$= \frac{10000}{32} \sqrt{3} \text{ nearly.}$$

Q. 3.—A body is projected vertically upwards with a velocity of 64 feet per second, find the height to which it will ascend.

A.—I have just proved that the space in such a case may be determined by

$$s = wt - \tfrac{1}{2} gt^2 \quad \text{---- ---- ---- ----} \quad (a)$$

$$\text{but } v = w - gt$$

and when the velocity ceases $o = w - gt$ or $t = \frac{w}{g}$. Substituting this in (a), we have $s = wt - \frac{gt^2}{2}$

$$= \frac{w^2}{g} - \tfrac{1}{2} \frac{gw^2}{g}$$

$$= \frac{w^2}{g} - \frac{w^2}{2g} = \frac{w^2}{2g}.$$

But w is given $= 64$ feet and $2g = 64$ feet

$$\therefore S = \frac{u^2}{2g} = \frac{(64)^2}{64} \text{ which will give the height required.}$$

Q. 5.—Two perfectly elastic bodies move in opposite directions. A's mass is twice B's, and B's velocity $2\frac{1}{2}$ A's. What happens when they meet?

A.—Suppose the bodies first to be inelastic. Let them be A and B, and their velocities before contact V and v, and their common velocity after it c:

$$\text{then } c\,(A + B) = A.V + B.v.$$

$$\therefore c = \frac{AV + B.v}{A + B}$$

But when they move in opposite directions

$$c = \left(\frac{A.V - B.v}{A + B}\right)$$

Now suppose the bodies to be *elastic.* In this case

$$c = 2\left(\frac{A.V - B.v}{A + B}\right)$$

Assume B's mass = b, then A = 2b

and A's velocity = a, then $v = \frac{5}{2}a$

$$\therefore c = 2\left(\frac{2ba - \frac{5}{2}ab}{3b}\right) \text{ and the velocity lost}$$

$$\text{by } A = V - \frac{A.V - B.v}{A + B}$$

$$= \frac{B\,(v - V)}{A + B}$$

applying this to the proposed case, and substituting the values of V, v, A, and B, we shall have the velocity lost by A: and by a little different method we can determine the velocity gained by B.*

STATICS.

[These three questions set to the Senior Class were taken from the Government paper. The answers are by the same student, Radhakishen.]

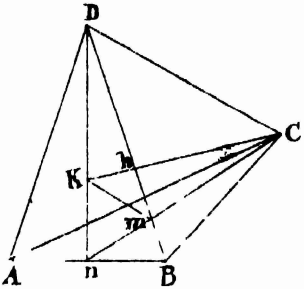
Q. 1.—Define the centre of gravity of a body.

* The sixth question was, "Determine the path described by the common centre of gravity of two bodies, one twice the mass of the other, the smaller describing the circumference of a circle, the greater stationary at a given point within or without it." It does not appear that any student attempted to answer it.

A.—The centre of gravity is a point in a body which, being supported, the whole body is in equilibrium.

Q. 2.—How do you find the centre of gravity of a right cone?

Suppose ADCB to be a triangular pyramid of uniform thickness. Divide AB into two equal parts in the point n, and join nc and nD. Take nm $= \frac{1}{3}$ nC and nk $= \frac{1}{3}$ nD, then m and k will be the centres of gravity of two triangles ABC and ABD. Join kc and mD. These two lines may be considered passing through the centre of gravity of the pyramid, and therefore the centre of gravity will be the point h, the intersection of the two lines mD and kc. Now we have to determine mh.



Since nm : mc : : nk : kD

$\therefore$ km is parallel to DC

$\therefore$ nm : nc : : km : DC

but nm $= \frac{1}{3}$ nc

$\therefore$ km $= \frac{1}{3}$ DC

and since $\triangle$ kmh is similar to the $\triangle$ hDC

$\therefore$ km : DC : : hm : Dh

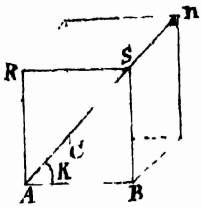
whence it is proved that hm $= \frac{1}{3}$ hD

$= \frac{1}{4}$ Dm

Similarly may be found the centre of gravity of a pyramid whose base may be of numerous sides, which base may in the limit be conceived to coincide with the circumference of a circle described in them. In this case the pyramid will become a right cone, whose centre of gravity will be $\frac{1}{4}$th of the altitude from the base. Though this may very easily be determined by integrals, I have not used that process here, but have found it by a Geometrical method.

Q. 3.—Three equal forces act on a point, each in a direction perpendicular to the plane of the other two. Find the Resultant.

A.—It is evident that these three equal forces will form a solid like An, the diagonal An of which will be the Resultant of the forces.



$An = \sqrt{3\overline{AB}^2}$

and $\frac{nS}{An} = \tan k$: Here k represents the ∠ which the Resultant form with the plane BR. This will be known as all the sides and Resultant are known.

AGRA COLLEGE, LITERATURE PAPERS.

Questions in Gibbon's Decline and fall of the Roman Empire, (Chapters I., II., III., XLIV., LXVIII.), proposed to the Senior English Class in the Agra College, and answered by Sookh Deo Buksh.

Question.—Describe the policy of Augustus with regard to foreign conquest; how far, and from what cause was his policy carried out by his successors. Note the exceptions to the general rule?

Answer.—Foreign conquests had been accomplished under the republic under Marius and Sylla, under Pompey and Cæsar, but it was reserved for the policy of Augustus not to extend them any further, but to manage the internal affairs and consolidate that which he had already got in his possession; he prescribed to his successors to confine their empire within the following limits, the Danube and Rhine on the north, the Euphrates on the east, the Atlantic Ocean on the west, and the Deserts of Africa and Arabia on the south. This policy was carried on by his successors on account of their weakness; they never attempted to go beyond these limits. The conquests of Britain and Dacia, of the countries on the east of the Euphrates, the two last of which were achieved by Trajan, form exceptions to the policy of Augustus.

Q.—Describe the state of the Roman army under the early emperors, its internal economy, and distribution in the several provinces of the empire. To what causes may be attributed the insignificance of the Roman navy?

A.—The Roman army under early emperors consisted of (30) legions, each of which consisted of ten (10) cohorts and (10) squadrons; in the first cohort which claimed the honour of carrying the eagle, there were (1105) soldiers, and each of the rest, that is, of the remaining nine (9), was composed of (555), so that in a legion the number of persons constituting the infantry was 6100. As for the squadrons, the first of them consisted of 132, and in each of the rest there were 66 persons. The first squadron accompanied the first cohort. Still the legion was incomplete as long as some auxiliary troops were not joined to it, which being done, the whole amount of a legion was 12,000 men. Each soldier was accustomed to carry with him besides his arms, a bag containing his provisions, and on the appearance of an enemy, they were to throw away their loads and put themselves in order. These legions were distributed in the following manner. Three (3) in Britain, (16) in the countries on the banks of the rivers Rhine and Danube, one (1) in Spain, one (1) in Africa, and one (1) in Egypt, and the other eight were ordered to remain in Asia Minor, five of which were to take their stations in Syria, and the others in the northern parts. While these legions were thus distributed in Italy, there was a stationary army amounting to 1,20,000 men, and attending the Emperor himself, who was surrounded by the Prætorian guard.

The insignificancy of the Roman navy may be attributed to their not being well skilled in the art of navigation, and their conquests not extending beyond the Ocean. They had only to sail along (if they had any occasion) the coasts of the Mediterranean.

Q.—Enumerate and describe briefly the Provinces of the Roman empire.

A.—The following are the provinces of which the Roman Empire consisted in those days.

1st. Spain.—This country is bounded on the north by the Pyrenean mountains, on the west by the Atlantic Ocean, on the south by the Straits of Gibraltar, and Mediterranean Sea. It was divided into three parts, Bœtica, Lusitania, and Tarraconensis. The two first are now called Andalusia and Portugal, respectively, and the third one comprises the kingdoms of Castile, Arragon, &c.

2nd. France.—Formerly this Province extended from the Pyrenees to the river Elbe, and the Cantons of Switzerland were comprised in it; so that it was bounded on the north by the river Elbe, on the south by Spain, on the west by the Atlantic Ocean, and on the east by Mœsia and the northern part of Italy. It was divided into six Provinces, Narbonensis, Aquitain, Belgica, Celtica, Upper Germany

and Lower Germany. The Roman Provinces on the river Danube were Mæsia, Rhætia, Noricum, Pannonia, Dalmatia and Dacia, and the other provinces were Macedon, Thrace, Greece, Africa, Egypt, Syria, Phrygia, Cappadocia, &c.

Q.—To what causes may be traced the degeneracy of the character, and decline of the genius and courage of the Roman people?

A.—The causes were that the minds of the people had degenerated, their strength and bodies were enervated by luxury, the soldiers had no sense of honor, their courage was sunk, and legions were supplied by soldiers either from the inhabitants of foreign countries or from the barbarians of Illyria and Dacia. Indolence prevailed over the Roman world, both in military exercise and learning, so that in a short time, they lost both their fame and genius.

Q.—Explain the political system and mode of government established by Augustus; what functions did the senate exercise under him, and his successors?

A.—The historian says that the form of government established by Augustus was "absolute monarchy disguised in the form of a commonwealth." At first, Augustus gave up the empire to the senate, and contented himself with a private station among the members, but afterwards, he was obliged to take the government upon himself. He reformed the senate and raised the qualifications of its members, and himself took the title of the prince of the senate. He divided the provinces of the empire between the senate and himself. The provinces that fell to his share were such as lay under the greatest danger; whereas those that were given to the senate had no sort of disturbance to fear. By these means he kept the army (which always devoted itself to the house of Cæsar) under his command, whereas the senate had the Civil jurisdiction. Under him the senate was the grand tribunal for criminal matters, and in civil affairs an appeal lay to it in the last resort.

Questions in Hume's History of England proposed to the Senior English Class in the Agra College, and answered by Sookh Deo Buksh.

Q.—Describe the state of Britain under the Roman rule. By what General was the country reduced, and what causes led to its evacuation by the Roman forces?

A.—In the time of the Romans, the inhabitants of this island were just emerging from their previous barbarism, but still they were not allowed to remain in peace; they were constantly harassed by the northern tribes. Cassibelaunus was the first who opposed the Roman army, although he did every thing which becomes a general of such a country, at such a time; but was unable to check the progress of a disciplined army that was accustomed to victory from a long time. After this victory, the Romans continued in a fickle state, they were frequently disturbed by the revolts of the natives, and were obliged to demand new supplies from their mother country. Once, the King of East Anglia bequeathed half of his dominion to his daughter, and the other remaining to the Roman general, provided that he should take care of his daughter's share; but the unfaithful general, instead of protecting, ravished her, and took the whole of it into his possession. The inhabitants were enraged, and collecting a force, chastised the ravisher.

On another time the Roman army was opposed and disturbed by the celebrated Caractacus; this gallant general was defeated and taken prisoner.

Thus the island continued in a changeable condition, the inhabitants endeavouring to throw off the Roman yoke, while the other party were suppressing these revolts, and establishing their own power.

Matters continued in this manner till the British were finally subdued by the Romans under Agricola; several generals, such as Plautius, &c., at different times undertook to subdue this island, but the Commander that finally conquered it was Agricola.

While the Roman Empire was overrun by the barbarians of the North, every time, step by step, the Roman forces in Britain were diminished, and were unable to protect the inhabitants from the invasions of the Picts and Scots; so that as the Roman power decreased in the continent, their forces were gradually withdrawn from the island, till at length it was left by them in the year 426 A. D. The Britons still continued idolaters. The Druids had the same power as they had before.

Q.—Narrate the progress of the Saxon conquest of England; describe the limits of the several kingdoms of the Heptarchy; under what monarch, and at what date were they united?

A.—When the Romans evacuated the island, its inhabitants remained exposed to the attacks of the Picts and Scots. Being unable to contend with them, they invited the Saxon tribes from the continent. (1.) Hengist was the first of them, who landed on the isle of Thanet, and afterwards settled in Kent. (2.) After this Cerdic led

a band of that hardy race, and established his dominion in the counties of Surrey and Sussex, &c., which at that time constituted the kingdom of Sussex. (3.) Being allured by the fertility of the land, another number left its country and settled in the counties of Berks, Dorset, Somerset, &c., which constituted the kingdom of Wessex. (4.) Another party came from the continent and settled in Essex and Middlesex. (5.) A fifth one settled in the counties of Norfolk, Suffolk, &c., which composed the kingdom of East Anglia. (6.) A sixth one settled in those counties which have the river Severn on one side, and the last two named kingdoms on the other. (7.) The seventh one settled in the north, and formed the kingdom of Northumbria which included the counties of Northumberland, Durham, &c.

The limits of the several kingdoms are apparent from what has been mentioned. When the Saxon kingdoms were thus established, and they had no enemy to contend with, they began to encroach upon each other's dominions, so that one State continued to sink into another, till all of them were united into one kingdom under Egbert the king of Wessex, in the year 827 A. D.

Q.—Give the dates of the accession and death of Alfred the Great; describe the defensive measures which he adopted to repel the measures of the Danes, the judicial system which he introduced, and the mode in which he carried out his plans for the education of his subjects.

A.—Alfred the Great ascended the throne in the year 872 A. D. and died in 900 A. D. In order to repel the invasions of the Danes, he established the National Militia, and increased the English Navy. He divided the kingdom into counties, and each county into hundreds, each hundred into tithings,* and ordered a Court to be held in each hundred every month (or more as the occasion might require) for the trial of civil and criminal cases, but these cases were not so important as to affect the public; if they were so, they were tried at the County Court, which was held twice a year, that is, in the Easter and Michælmas terms. In the former, namely, the hundred Court, twelve persons of good character were chosen to represent the persons of the hundred, and in each hundred a bars-holder was appointed to answer the misdemeanors of the people under his powers. When a person committed any crime, the bars-holder was to answer that; unless it was proved that he acted contrary to his will, in that case the person was committed to prison. In the other, that is, the County Court, freeholders were chosen, and cases that were not decided in the former were tried here. And in the last resort, the appeal lay from them to the King in Council. For the education of his subjects, Alfred established the University of Oxford.

* A tithing consists of (10) ten families.

Q.—On what grounds did William the Conqueror rest his claims to the English throne? Describe his character, and the manner of his death. What effect had the Norman conquest on the language and manners of the country?

A.—William the Conqueror claimed the throne of England alleging that he had been appointed a successor to that Crown by Edward the Confessor, and that the reigning monarch, that is, Harold, was a mere usurper, he being a General of the late King had no right to the throne. He fell from his horse, and, his collar-bone being broken, he lost his life.

He was a man of middle stature, of firm constitution and exalted mind, his braveness never left him; although his body was weakened on account of age, yet he was not daunted by the revolt of his son Robert, the Duke of Normandy. The public danger was ever before his eyes; whenever he heard of any revolt or other danger, he immediately went there, and suppressed it by his valour, he preserved his dominions, both in England and on the Continent, in his possession. Also he was beloved by his subjects. On the Norman conquest, the feudal system was introduced into England, and the language of the country was changed.

Q.—Describe the ancient condition of Ireland. In whose reign, and under whom were the English forces first led into that country? Describe the provisions of Brehon Law. Give a short sketch of the Irish administration of the Earl of Essex, and of Cromwell. When was Ireland erected into a kingdom?

A.—The ancient inhabitants of Ireland were barbarous and idolaters. Brehon Law was then in force; every thing was determined by that law; the country was divided into five provinces, Leinster, Munster, Meath, Ulster and Connaught; each of them was governed by its own King, and that which dared to appear the common enemy, was styled the King of the whole country.

Strongbow, the Earl of Pembroke, first led the English forces into that country; in the reign of Henry the 2nd, Brehon Law was a traditional law, and in some parts contrary to the law of nature. This Island was erected into a kingdom in the reign of Henry VIII.

Q.—Enumerate the principal enactments of Magna Charta. By whom, and under what circumstances was it granted?

A.—The following are the principal particulars of Magna Charta. It was enacted, that the laws of Edward the Confessor, should be restored, that in the enactment of a law, the barons and the bishops should be summoned by the King's letters patent, and that no law

should pass contrary to the will of the barons and bishops, that the Commons should be summoned by the sheriff of each county, and sent to Parliament, that the weights and measures should be the same throughout the whole kingdom, that the King's Court of Common Pleas should no longer follow the King's person, but be held in a certain place, that no money should be leived by way of taxes, but by the consent of the Parliament, that no money should be paid to the King, but on the three following occasions, viz.

1st. In the time when the kingdom should be under some danger; 2nd, when the King's son should be knighted; 3rd, on the marriage of the King's daughter.

These were the principles of the Magna Charta, which was granted by King John, when all the barons assembled and prepared for a revolt in case of refusal. He resolved at first to oppose them, and refused such an extraordinary grant: but the number of the barons being too great, it was beyond his power to suppress them, so that he was obliged to grant what they required.

Q.—Describe the conquest of Wales and the wars waged against Scotland by Edward the first, the most prominent legislative enactments of his reign, and the character of his civil administration?

A.—Till the time of Edward the first, the people of Wales continued to harass the English, whenever they found the opportunity.

This monarch led an army who fled to the mountains, their natural bulwarks; there they considered themselves safe from all dangers, and indeed these mountains had baffled all the efforts of the preceding invaders. Leven was the King of that mountainous country in the time of Edward I: the first army of the English returned without success; and a peace was concluded in which the Welsh King acknowledged the supremacy of the English King, and paid homage. But as soon as he had an opportunity, he invaded the western part of England, and plundered it. Edward was enraged at this, and led an innumerable army into that country. As soon as he appeared there, the Welsh again fled to their mountains, and Edward pursued them; he laid siege to their fortresses, and ascended the steep and rocky mountains, which they deemed impregnable. Their forts were taken, and the kingdom was subdued. While the King subdued this part, he heard of the death of the King of Scotland.

Three persons laid claim to the throne of this kingdom; one of them being unable to contend with the others, had recourse to the assistance of Edward. This monarch at first seemed to espouse his cause, but afterwards laid his own claim to the throne, and alleging his right, defeated the army of that nation, and took possession of the throne. The bro-

ken army of the Scots fled to the north and was pursued by the king, who, after establishing his own power, returned to England. There arose in his absence William Wallace, a person of mean birth, but of high qualities. By his bravery and conduct he excited the people of that country, who reluctantly bore the English yoke, and collecting an army, he drove the English out of his country and raised to the throne one of the former advocates. When this news reached King Edward's ears, he immediately marched with a great army towards the North, and both armies met at Falkirk. A battle ensued in which the Scots were defeated, but Wallace showed all the qualities of a good General, and tried as much as he could to turn the balance on his side, but he could not: he, with the remainder of his forces, fled to the north, and left the province in the possession *of the throne.* Edward was not secure whilst Wallace was alive. This gallant man was afterward betrayed by his countryman John Montieth, and was executed by the order of the king. With regard to jurisdiction, Edward is called the English Justinian. The important enactment of his reign was that the Commons were introduced into the parliament, and its present form was established. He suppressed the power of the clergy, and the barons observed the rights of the Commons, and freed them from several ties which they lay under, till this time. He confirmed Magna Chartar, and enacted many laws in favour of the liberty of the people.

Q.—Give a brief sketch of the French campaigns of Edward III. and of Henry V.

A.—The conquest of France in the reign of Edward III. was achieved by the Black Prince.

Hearing of the disturbances of France, King Edward III. led an army into that country with his son, the Prince of Wales. Both armies met at Cressy, and the French army exceeded the English in the proportion nearly of three to one, that is, the French amounted to 100,000 men, while the English were only 30,000. Being surrounded by such a great multitude, the English King tried as much as he could to avoid a general engagement, but being unable to escape, he was obliged to engage. When both armies prepared for battle, King Edward withdrew himself from the field, and ordered his valiant son to conduct the forces against the enemy. The prince acted beyond the expectation of his father, who, on hearing him warmly engaged, exclaimed in this manner, "he shall not receive any succour from me; this day will be the day of his glory." After a bloody contest the French were defeated. Edward returned to England, and afterwards sent that prince to suppress a rebellion which had taken place in his absence. In the time of Henry V. a trouble arose in that kingdom, and that tempted his arms, and landed in that country with his two brothers and an army of 9,000 persons. He proceeded forward to the

place named Agincourt. Here he met the French army who exceeded his ten times, but his gallant and brave disposition turned the scale of victory into his favour. Prince Dauphin fled to the south, and Henry took possession of the throne and proclaimed himself the king both of England and France. After establishing his power and appointing his brother the Governor of that place, he returned to England.

Q.—Relate the history of the origin of the wars of the White and Red Roses. What claims did the contending parties advance to the English Crown? In what monarch, and how were those united and set to rest?

A. Edward III, besides the Black Prince who died before him, had several other sons. The descendants of the Duke of Clarence stood next in succession after the failure of the descendants of the Black Prince. From this Duke descended the house of York that distinguished itself by the name of "White Rose." From the other son of Edward III, that is from John of Gaunt, Duke of Lancaster, descended the Lancastrians, who distinguished themselves by "Red Rose." Thus arose the factions of White and Red Roses. Henry IV. setting aside Richard the II. the lawful successor to the throne, gave rise to war, but during his and his son's reigns, no disturbances were raised by the other party; and Henry VI. fell a victim to their then rage. Several wars were carried on between the Yorkists and the Lancastrians during his reign. The former were commanded by the Duke of York, who afterwards came to the throne under the name of Edward IV. and the latter by Queen Margaret, the wife of Henry VI. who was of a weak disposition. At last the Yorkists were victorious, and got possession of the throne. Still the disturbances of the factions continued; till both of these were united in the person of Henry VII. who was descended from John of Gaunt, Duke of Lancaster, and married Elizabeth, the daughter of Edward IV.

Q.—Contrast the characters of Henry VII., Henry VIII., Queen Mary and Queen Elizabeth. Describe the state of English commerce during the reign of Henry VIII. and the principal event in the reign of Elizabeth?

A.—Henry VII. was a good monarch, of a mild disposition. He restored to the Commons the power of which they were deprived: he did not lavish his money, but despite the expense of all those wars, he collected an immense sum of money, and left it for his successor, whereas his son Henry VIII. lavished all his treasure in trifling wars and merely in obtaining fame. Henry VII. has been said to be an avaricious man, but in reality he was the only person that could add strength to the Government, whereas in his successor's time the State was weakened by his extravagance. Besides this, Henry VIII. was a very cruel and unnatural man; religion was the thing by means of which he destroyed many nobles and Commons; he who favoured the

Protestant faith was accused of heresy and condemned to be burnt, while he who professed himself to be a Catholic was hung.

Queen Mary was a bigoted Catholic, all persons that escaped the rage of the tyrant the father, were put to death by her order. Lady Jane Grey, her husband, Cranmer, Latimer, Hooper, Ridley, Ferar, &c., all were burnt,—she doted devoutly on her husband Phillip of Spain; whereas Elizabeth, though inclined to the Protestant faith, was ever mild, and never used violence with those of the opposite party; contrary to Mary, she preferred public good to her own, and thence resolved never to marry any one, while her sister involved her kingdom in a French war merely for the pleasure of her husband, Phillip. In the reign of Henry VIII. English commerce was only confined to the Netherlands, and was carried on on a very narrow scale. The principal event of the reign of Elizabeth was the trial and execution of Mary, Queen of Scots.

Q.—What was the state of national feeling in Great Britain during the reign of James I? Describe the gradual growth and extent of the power of the Parliament, and the causes which led to the overthrow of the monarchy, and the establishment of the Commonwealth.

A.—The minds of the people in the time of James I. were inclined to the principles of liberty, and the king not knowing this, considered his prerogative in the same sense as this was considered by his predecessors. Although the minds of the people were changed, yet they were kept in awe by the respect and reverence due to the king; but this only lasted for his reign, and the people broke out in rebellion when the same prerogatives were enforced on them by his son Charles I.

It was the demand of tonnage, poundage and ship-money, that made the subjects take arms against their Sovereign to overthrow the monarchical form of Government, and establish in its stead a Commonwealth.

QUESTIONS IN MCCULLOCH'S POLITICAL ECONOMY PROPOSED TO THE SENIOR ENGLISH CLASS IN THE AGRA COLLEGE, AND ANSWERED BY A. SHARPLEY.

Q.—Define Political Economy, and state why it was neglected in Greece and Rome?

A.—The words Political Economy are derived from three Greek words πολις a city, οἰχος a house, and νομος a law, and means "the Go-

vernment of a city or community regarded as one family." "It is the science of the laws which regulate the production, accumulation, distribution and consumption of wealth, which constitutes those articles which are agreeable, necessary, and useful to man, and which possess at the same time exchangeable value." The production of wealth was regarded by the Greeks and Romans as degrading and effeminate. None but helots and slaves were employed in the cultivation of fields and in commerce, which act was seldom patronised; even Cicero considered it as mean and degrading. Luxury was ever denounced by the ancient philosophers as the door of vice and effeminacy: loans and interest on them were called by the opprobrious name of usury; persons then regarding its very object and principles with such abhorrence and contempt, were very unlikely to cultivate it as a science.

Q.—What are the circumstances that fix the wages of labour in the learned professions, as well as amongst day labourers.

A.—The following, viz. The agreeableness or disagreeableness of the employment. (2). The easiness and cheapness or the difficulty and expense of learning them. (3). The probability or improbability of succeeding in them. (4). The small or great trust to be reposed in them that carry it on, and, (5). The constancy or inconstancy of the employment. With regard to the (1). If two employments were offered a man with the same salary he would choose the more agreeable of the two. Now every man is placed in this situation, nor will he accept of disagreeable employ unless a sufficient inducement is offered him; it is this which makes the wages in mines so very high, while those of husbandmen are so low. (2). Man may be considered as a machine; the more the capital laid out on him, the more he is worth. Thus then the more difficult the work, the longer he takes to learn it, and the more time he spends in training; for this he must be paid, or he will not attempt to qualify himself for it. (3). Supposing there were ten men qualifying themselves for a Moonsiffship, one out of the ten is likely to succeed; 100 rupees are laid out on each, profits are 10 per cent; the man who succeeds must not get 10 rupees but 100 rupees, not profit on his own capital only, but also on that of the unsuccessful candidates. (4). We trust our lives to the physician, our gold to the Banker; now these must be paid proportionably high to support the dignity requisite to so high a trust. (5). Bricklayers and thatchers are employed only at certain seasons when the weather permits. Now it is plain that they must be paid not only for the time they work, but also during the time they remained idle, for the loss of time and anxiety of mind, or the trade would be forsaken.

Q.—Why would a mercantile man prefer a steam conveyance to an ordinary one, though the former cost him twice as much as the latter?

A.—I am not sure that a merchant would *always* prefer a steam carriage or vessel to any other, unless the advantages derived from the steam conveyance counterbalanced the additional money paid for it; the goods of a merchant are procured by a payment of money and they constitute his capital; now this merchandize must pay him for the length of time it has been on his hands, so that it is not immaterial to him when he sells his goods, that is, if he sells them at the same rate. I remember a short anecdote illustrative of this: a farmer (an Irishman of course) once made a good bargain in the purchase of a pig, which by feeding and keeping he might have sold to advantage. His friends were surprised at seeing him sell it again five minutes after for a profit of one shilling only. Being taxed for his folly, he replied "Arrah, faith, an I make a profit of one shilling every five minutes, how many shall I make in a year?"—Here then lies the advantage in a steam conveyance: it admits of speedy transit, and consequently speedy sale. He who brings things first into market is likely to dispose of his things soonest, leaving the additional profit he may gain there by coming into market first, and selling his things to advantage out of the question. His capital is then set free to enter into another undertaking and fresh profit. Besides a merchant's own loss of time is generally calculated in the price of goods which is made up of wages and profit. The less the wages (the speedy transit saving it) the more the profits.

Q.—How does credit facilitate production?

A.—No industrious undertaking can be entered upon nor any thing produced without capital. Credit therefore cannot produce any thing, since what is given to one is taken from another. Its influence however is shown in another way. All that credit does or can do is by facilitating the transfer of capital from the hands of one into those of another, to bring it into the possession of one who is most likely to make the best use of it, to lay it out in a manner in which it will produce most.

Q.—Prove that the population of a country is generally proportioned to the means of subsistence which it affords?

A.—Nothing is more evident than the principle which is natural to men, and which induces to multiply his species. This desire is not only natural but very strong, and requires to be repressed, and is *only* repressed by the difficulty of providing support for his progeny. It is this desire which keeps population up to the means of support, may even to go beyond it; but there comes the antagonist starvation, "disease" and "death." This always reduces population to the means of support. These are the antagonistic forces which keep population "in the right course between two extremes."

Q.—How far should Govermnent interfere with the pursuits and property of individuals?

A.—Government should always consider it as a positive law "not to interfere in the lawful pursuits of others, but to let them employ their time, labour and capital as best suits them, so long as they are not detrimental to the interests of the public," and interference as exceptions only. Let us see what these duties and exceptions are. They should enforce the law of private property, personal security, and personal liberty; enforce the fulfilling of legal contracts, should negotiate the interests of the commercial community in foreign nations, to encourage associations for commercial purposes, taking care however not to grant them monopolies, &c., &c.

They themselves may and should engage in two profitable undertakings, (1) coining of money: thus ascertaining the legality of payments, through which, otherwise, there might be endless disputes, and (2) the carriage of letters, which cannot be more safely or more expeditiously carried on by private parties.

Q.—State the advantages or disadvantages which merchants give or receive. Are they generally beneficial or otherwise?

A.—Corn merchants, although there is such a hue and cry after them, are always beneficial to the nation, and never injurious, save to themselves. They buy and store up the surplus produce of a plentiful harvest, and distribute it equally throughout the year. Some say that they store up corn, and keep it till the price rises high, and then make exhorbitant profits on it. This might be the case were there only one corn merchant in the country; but the case being otherwise, this may not be feared. Competition among themselves will prevent it, and by making them sell it at a reduced rate ruin themselves and not the community. They prevent the improvident waste of corn, and are thus a safeguard against famine.

Questions in Blackstone's Commentaries on the Laws of England, (Vol. 1.) proposed to the Senior English Class in the Agra College, and answered by Ameer Khan.

Question.—Explain the meaning of Law, as a general term, and define in particular Municipal Law, indicating its different parts or functions, and the different force of its declarations in regard to actions that are intrinsically right or wrong, and such as are in themselves indifferent?

ANSWER.—Law in its most general and comprehensive sense, signifies a rule of action, and is indiscriminately applied to all kinds of action, whether animate or inanimate, rational or irrational. Such as we say, the laws of Motion, of Optics or Mechanics, as well as the laws of Nature and Nations. It is that rule of action which is prescribed by some superior, and which the inferior is bound to obey.

Municipal law means the law of some particular Municipium or free town, but it may mean, in general, the law of any nation that is governed by corresponding laws. The Municipal law thus understood, may be defined to be "the rule of civil conduct, prescribed by the "supreme power in a state; commanding, what is right, and prohi-"biting, what is wrong." I will enter into the discussion of its several parts, as far as time will permit. And 1st, it is a rule; not a transient or sudden order, it is not a compact or agreement; but something permanent, uniform and universal; the language of agreement is "thou mayest do or mayest not do,"—that of the law is "thou shalt do or thou shalt not do." It differs far from advice. Next it is a rule of civil conduct; in this case, it differs from the laws of Nature, the object of the former is the rule of both the civil and moral conduct, while that of the latter is only that of moral conduct. It obliges man to obey the command of society, in which he enjoys all kinds of happiness and peace.

It must also be prescribed, or settled and proclaimed before an action committed passes into a crime, and not so that a man doing any thing, he knew not to be ill in the result, be punished for it at the same time; for he is quite ignorant of the nature of the act, and knows not that a thing allowed at first to be innocent, will turn to a crime at the instant he does it, and that he will be punished for it. This would be only to enslave the people as Caligula did, who hung his laws on a lofty gibbet to hide them from general view. It must also be prescribed by the "Supreme power in a State." We know that legislation is the work of the highest authority, and not fit to be trusted to inferior hands. Then we must also mention where that supreme power lies. It must be trusted to the hands where the three grand requisites of wisdom, goodness, and power reside, wisdom to discern the real interest of the community; goodness to endeavour always to pursue that real interest, and strength to carry this knowledge and intention into action. This power, sometimes, lies in Monarchy, sometimes in Aristocracy, and sometimes in Democracy; but in England, it lies in the Parliament, the last part of our definition is "commanding what is right and prohibiting what is wrong." Since the primary objects of the law are right and wrong, boundaries must first be set to them. For this purpose, every law consists of four parts; the one, Declaratory, whereby the rights to be observed, and the wrongs to be eschewed, are clearly defined and laid down: another, Directory, whereby the subject is instructed and enjoined to

observe those rights, and to abstain from the commission of those wrongs; a third, Remedial, whereby a method is pointed out to recover a man's private rights and redress his private wrongs; to which may be added a fourth, usually named Sanction or the Vindicatory branch of law, whereby it is signified that penalty should be incurred by those who commit injuries and transgress or neglect their duties. Now we have finally established the several parts and functions of the definition of Municipal law. The actions that are intrinsically right or wrong are the following: It is right to maintain children, to educate them, to support parents in their old age, to obey the superiors, to live in peace, &c. Those that are wrong, or *mala in se*, such as murder, &c., which is naturally evil. Those actions that are indifferent in themselves or *mala prohibita*, or such as are not naturally wrong, but prohibited by the law of Nations, such as carrying salt without paying the duty on it.

Q.—In case of doubt, by what methods are laws to be interpreted?

A.—The following are the methods of interpreting law, when there arises any doubt about its being not understood; words, context, the subject-matter; its effects and consequents; and the reason and spirit of the law that moved the author to enact it; first, words are generally to be understood in their most known signification, not so much regarding the propriety of Grammar, as in their common use; the law prohibits laying hands on priests, not meaning merely to prohibit touching a priest, but relating to the event that a person had killed a priest. If words happen to be still dubious, they must be interpreted from the context; when the law declares murder to be felony without benefit of clergy, we must turn to the context to see what is meant by benefit of clergy; or as the law prohibits simony and simonical contract; to understand which declaration, we must first ascertain what does "simony" mean.

Words are also understood from the subject-matter, as for instance the prohibition to buying provisions at Rome; which does not mean the supply of corn or any thing else, but the selling of Church, preferments, and indulgences, by the Pope, which was termed "provision."

4th.—They are still more palpably known from the effects and consequences of the law, as it is ordained that whoever draws blood in the streets should be punished; but in the case of a Surgeon who opens the vein of a person fallen by a fit in the street, he naturally is not to be included in the list. 5th. Lastly, they are understood by meditating on the spirit and reason of the law. There was a

Roman rule, that whoever should remain in a ship in the time of a storm, the property, if saved, should be divided amongst them. Once it happened that all escaped; and a sick person, who could not save himself, remained in the vessel, which by chance arrived safe on shore; now the Judges decided that his claim was not according to the established law, of which the intention was to encourage persons not to leave their ship in distress, but to save it as much as possible, and the sick man was not able to assist in the saving of the vessel in any way, nor had he the option of leaving it.

Q.—Of what two parts does the Municipal Law of England consist, and what other countries are at all subject to it, and under what circumstances and on what terms did they become so?

A.—The Municipal Law of England or the rule of Civil conduct prescribed to the inhabitants of this kingdom may, with sufficient propriety, be divided into "*lex non scripta*," the unwritten or common law, and the "*lex scripta*," the written or the statute law.

Under the first term are comprised the general customs, the particular customs, and certain particular laws, used in some particular Courts, and under the second term, the statutes, acts or edicts made by the king, by and with the advice of the Lords Spiritual and Temporal and Commoms in Parliament assembled. Exigency requires me to be brief,—Wales is one country subject to the laws of England; it was conquered in 1283 by Edward I., his son being the first prince of Wales. A statute of Henry VIII. ordains four articles; 1st, that Wales and England shall be united into one kingdom; 2nd, that all Welshmen born, shall have the same privileges as all others of the king's subjects; 3rd, that the right of succession or of the eldest son shall be the same in Wales as in England, and 4th, all the laws of England, and no other, shall be passed in Wales, besides several other constitutions of that principality with respect to police.

The other country is Scotland, united to the Kingdom of England and Wales, by the Act of Union, the principal of the twenty-five articles of which as given in Blackstone, I recollect; but time does not allow me to mention them. The Act of Union was passed in 1707, in the reign of Queen Anne. Still as a proof of my knowing those articles the 1st of them is, that on the first of May 1707, and even after, the two kingdoms of England and Scotland shall be united into one kingdom, under the name of Great Britain, &c.

The third is Ireland, which was conquered in 1172, under Strongham, in the time of Henry II. King John went there, taking many learned sages of the law, abolished the use of the Briton law, and put in force there the laws of England. At present 4 spiritual Lords, 28 Temporals, and 105 Commoners of Ireland, represent the

peerage and commonalty of that country, in the English Parliament. The Isle of Man, Jersey, Guernsey, Alderney, and Berwick-upon-Tweed are also subject to the laws of England, if they be particularly named in the Act. The Isle of Ely is not a county-palatine, though sometime erroneously so called, but only a royal franchise; Chester, Durham and Lancaster, were the counties-palatine, though two of them were suppressed and united to the crown in the times of Henry IV. and another English monarch. The American colonies are also in some respects subject to the English laws; being of three kinds, 1st Provincial Establishment, 2nd Proprietary Governments, 3rd Charter Governments. There are other counties also, called counties corporate; such are London, York, Bristol, Norwich, Coventry, and many others, and thus much for the countries subject to the laws of England.

Q.—What are the three principal rights of Englishmen, and what are the chief subsidiary rights by which the former are secured?

A.—The three principal rights of every Englishman are: 1st, personal security, which consists in a person's free and uninterrupted enjoyment of his life, his limbs, his body, his health and his reputation; 2nd, personal liberty, that consists in allowing one the power of locomotion of removing one's person to whatsoever place one's own inclination may direct unless restrained by due course of law, and 3rd, the right of property, that consists in a man's legal enjoyment of his own acquisitions unless otherwise ordained by the law of the land.

These grand bulwarks of English liberty are guarded, 1st, by the power, constitution and privileges of Parliament; 2nd, by the limitation of the King's prerogative, by bounds so certain and notorious that he could by no means exceed them; 3rd, by the right of petitioning the Courts of Justice, for redress of grievances; 4th, by the right of petitioning the King; and 5th, by having sufficient arms suitable to one's dignity, and allowed by the law of the land.

Q.—Explain the constitution of Parliament, the grounds on which a *separate* House of Lords rests, the privileges of its members, the laws and customs of the House of Commons in relation to the levy of taxes, and the elevation of members to serve in Parliament. Explain too what is meant by the adjournment, prorogation and dissolution of Parliament?

A.—The Parliament consists of the King; 2 Archbishops and 24 bishops, together with the Lords temporal of England, the 4 Lords Spiritual and 28 Temporals, together with 105 Commons of

Ireland, the 16 Peers and 53 Commoners of Scotland, and the 500 Commons of England.

The Parliament hath the power of making, enlarging, repealing, reviving, abrogating, and expounding laws concerning matters of all possible denominations, whether ecclesiastical or temporal, Civil, Military, Maritime or Criminal; there lies that despotic power, which must lie in some place or other, in other countries. It can alter and new model the successor to the crown; it can change the established religion of the kingdom; it can alter the constitution of the kingdom, and in short it can do every thing that is not naturally impossible. Some have called it the omnipotence of Parliament. The Lords and the King sit in one house, and the Commons in another; the privileges of the members of this august assembly are indefinite, yet still to mention some of them, as the privilege of speech, of person, of their domestics, and of their lands and goods and estates. The privileges relative to the Lords, separately, are numerous; as for instance, that of killing two deer in the King's forest, one in going and one in returning; that of making his proxy, another person in time of absence; that of being attended by all the Judges, &c., and of passing their protest and innumerable others.

The Commons have the privilege of raising taxes, of electing members to serve in the House, of creating Knights of the shire, citizens and burgesses, &c. The first privilege granted to the Commons rests on good grounds; for the Lords, being a permanent body, would have been subjected to the King's influence.

For the election of members to serve in the house of Parliament, there are three things required, 1st, the qualifications of the electors; 2nd, the qualifications of the persons to be elected; and 3rd, the proceedings at election.

As with regard to burgesses and citizens, Blackstone says,—they form the trading part of the nation, and therefore does not mention them here; therefore I proceed to give a brief sketch of the proceedings at election,—As soon as the Parliament is summoned, the Lord Chancellor, and in default of that, the Speaker of the House, sends his warrant to the Clerk of the Crown in Chancery, who thereupon issues out writs to the Sheriffs of every county, and every city and borough therein, to elect members to serve for them;—within three days, after the receipt of this writ, the Sheriff is to send out his precept under his seal to proper returning officers, commanding them to proceed to election, and the said returning officers after eight days, select the members, giving four days' notice of the same, and return the persons chosen, together with the precepts, to the Sheriff, who elects them at his county court, and sends them to the Clerk of the Crown in Chancery, who returns them, together with the warrant, to

Parliament. Bribery is punished by fines and by disabling both parties from serving in any office, unless they discover some similar circumstances—disturbing the process and intermeddling therein is likewise punished in the same way. Parliament is summoned on forty days' previous notice, by the King's Commission—adjournment is the continuance of session from one day to another; prorogation is its continuance from one session to another; and dissolution, the civil death of Parliament. Parliament may be dissolved in three ways; 1st, by the demise of the King, that is, six months after; 2nd, by the King's special commission, either in person, or by his representative; and 3rd, by time, of which the ultimate limit is seven years.

Questions in Stewart's Philosophy of the Human Mind, proposed to the Senior English Class of the Dehlie College, and Answers by Mukkhun Lall.

Question 1.—Give some instances of those words, the ambiguity and vagueness of which, occasion obscurity in the science of mental philosophy.

Answer.—First, "reason," in common and popular discourse means that power which enables us to distinguish truth from falsehood and right from wrong, and also to combine means for the attainment of particular ends. By some (among whom are Pope and Milton) its meaning is taken as extensively as that of the word "intellect." By Hume and other philosophers its meaning is circumscribed to that power by which we distinguish truth from falsehood and combine means for the attainment of our ends, while the power of distinguishing right from wrong, of vice from virtue, is ascribed to taste. According to Stewart, reason means that faculty which enables us to distinguish truth from falsehood, and combine means for the attainment of our ends, whilst under the head of reason he includes also, those faculties which are more immediately subservient to the power of reasoning, particularly, the discursive faculty and the power of abstraction. Reason has also been confounded with the discursive faculty, owing to the close affinity between reason and reasoning. Another word is "understanding," which, in common language, includes all those powers that are connected with the deductive processes of thought. It is so far from including imagination, wit and fancy, that it is taken in opposition to them, as in the following proverb, "a sound understanding and a warm imagination are seldom united in the same person." Sometimes its meanings are as extensive as that of the word "intellect," including also imagination, memory, and perception. There is also an ambiguity in the word judgment. Sometimes this word is as extensive as "understanding." If there be any difference

between these two words, it consists only in this, that the latter implies more of a positive ability than the former. To understanding, we apply the epithets strong, vigorous, profound; to judgment, cool, unprejudiced, unbiassed, impartial, solid. According to some logical writers, judgment is conversant about those truths of which we are conscious, for instance, it is owing to judgment that we give our assent to a Mathematical theorem, without following the train of reasoning. In treatises of logic, judgment is defined to be that power by which we affirm or deny the truth of any proposition, which Dr. Reid restricts only to mental affirmation or denial?

Q. 2.—On what evidence are we assured of our own existence, and wherein consists the inaccuracy of the common doctrine of our best philosophers on this subject?

A.—It is by the immediate evidence of consciousness that we are assured of our present existence as sentient and intelligent beings, and it is by reflection we are conscious that we ourselves exist. The proposition thus stated, however, is not accurately true; for the very exercise of reflection presupposes our own existence. The moment that a sensation comes into the mind, we learn two facts at once, the existence of the sensation and of ourselves as sentient and intelligent beings. Hence although the belief of our existence is concomitant with the exercise of reflection in the order of nature, yet it is posterior to it in the order of time, consequently it would be more correct to say that the belief of our own existence is a concomitant or accessory of the exercise of reflection?

Q. 3.—On what does the intellectual superiority of one man above another in all the different branches of moral and political philosophy chiefly depend?

A.—The intellectual superiority of one man above another in moral and political subjects depends chiefly on the rapidity of that inward process of thought, which enables us to make a correct interpretation of ambiguous words according to the sense in which they are used in different places.

Q. 4.—What purposes do the definitions answer in Mathematics, and wherein consists the difference between Mathematical definitions and those of other sciences?

A.—The definitions in Mathematics are the first principles, and serve for the foundation of Mathematical science. The definitions prefixed to Geometry are to the theorems what the axioms are to the problems. The definitions in Mathematics are merely hypothetical, while those of other sciences are founded on fact. There can be no line without breadth, nor no point without magnitude. But there is

such a thing as uniformly accelerated or retarded motion. To this is to be ascribed the accuracy so much admired, in Mathematics, and the ambiguity so much complained of, in other sciences, because Mathematical definitions, on which the whole science is built, are conversant about the properties or relations which are merely supposed; while the definitions in other sciences are conversant about those objects which have a real existence in nature, and consequently in drawing conclusions they are liable to be disturbed by other external causes.

Q. 5.—Explain the difference between the evidence of experience and that of analogy.

A.—The evidence of analogy is stronger than that of experience, and has a greater influence on the minds of the ignorant or the vulgar than on those of the wise. But the evidence of analogy is more liable to be wrong than that of experience.

Questions in Addison's Spectator proposed to the Senior English Class of the Dehlie College, and Answers by Mukkhun Lall.

Question 1.—But the most *notable* way of *managing* a *controversy* is that which we call "arguing by torture." This is a method of reasoning which has been made use of with the poor *refugees*, and which was so fashionable in our counties during the reign of Queen Mary, that in a passage of an author quoted by Monsieur Bayle, it is said the price of wood was raised in England by reason of the executions that were made in Smithfield. These disputants convince their adversaries with a *sorites* commonly called a pile of faggots. The rack is also a kind of *syllogism* which has been used with good effect, and has made a multitude of *converts*. Who were Queen Mary and Bayle, and where is Smithfield?

Answer.—But the most remarkable way of deciding a controversy or dispute is what is called arguing by torture, *(i. e.)* instead of employing arguments, as it should be in refuting an adversary, to use torture to convince the opposite party of one's own principles. This method of reasoning, or rather this mode of convincing another, has been used by the poor refugees, *(i. e.)* by those who have no real truth to inculcate, nor no argument to adduce in proof of it, and consequently, who betake themselves to other means for putting down an adversary than the use of arguments. This use of torture for converting an adversary to one's own belief was so prevalent in the reign of Queen Mary, that in a passage of an author quoted by M. Bayle, it is said that the price of wood was raised in England,

owing to the great demand of that article for the burning of heretics that was used in Smithfield. Owing to the bigotry of Queen Mary, who was a partizan of the Catholic Church, all who were found to be opposed to the Papists were burnt alive as heretics. This great consumption of wood increased the demand, and consequently raised the price of the article. The use of the "rack" in forcing conversions, answers as good an effect as a syllogism, which is here identified with "rack," because both answer the same purpose in changing belief.

The use of the words "arguing by torture," and the quotation from M. Bayle, show a great deal of humour in the author.

"Notable" means "remarkable;" "managing," "deciding;" "controversy," "dispute;" "refugee," "one who betakes himself to some contrivance or other;" "sorites," "a form of argumentation in which one inference is accumulated on another;" "rack," is "a machine containing a screw by which any substance is compressed," "syllogism," is a mode of reasoning invented by Aristotle, containing three terms, the two first are called the "premises," and the last term the "conclusion," the first, premise, is a major or general proposition, and the second, the minor or particular one: syllogisms are of two sorts, that in which any proposition is affirmed is called the affirmative, and that when any assertion is denied is the negative; "converts," are those who have changed their belief, particularly religious. Such disputants convince their adversaries with a sorites (which is metaphorically applied to a pile of faggots), or, in other words, they convert their opponents not by arguments but by threatening them with burning. Mary was the Queen of England, and daughter to Henry VIII. of England by Catherine of Arragon. She succeeded her brother Edward VI., and on account of her partiality to Papism, she exercised many cruelties over her subjects, most of whom were the followers of Luther. "M. Bayle" was a celebrated French politician. "Smithfield" is a town in Worcestershire, where heretics were generally burnt alive.

Q.—The soul considered *abstractedly* from its *passions*, is of a *remiss* and *sedentary* nature, slow in its *resolves*, and languishing in its executions.

A.—Not taking into consideration the passions, or supposing the soul to be deprived of passions, the natural tendency of the soul is towards inactivity and sluggishness: it is, without passions, slow in its attempts, and dull in the execution or completion of those attempts. "Passions" are the feelings of the heart which have a tendency to excite a man to any action, as avarice, ambition, hatred, resentment, benevolence, &c., "remiss" means negligent; "sedentary," sluggish, "torpid" or dull; "resolves," attempts, any thing resolved upon; "languishing," fainting, dull; "execution," performance, completion.

Q. 2.—The first thing to be considered in an epic poem is, the fable, which is perfect or imperfect, according as the action which it relates is more or less so. This action should have three qualifications in it. First, it should be put to one action; secondly, it should be an entire action, and thirdly, it should be a great action.

A.—The fable is the story of an epic poem comprising a number of incidents, but bearing upon one another; it may more properly be called the subject of the poem. By one action is meant that the action of which the fable consists should be one action, and not divided, as is the case with a drama. For instance, the Iliad which describes the wrath of Achilles, is one action. Had Homer commenced his poem from Leda's egg or from the siege of Troy, his poem would comprise several actions; entire action means that the action should have a beginning, a middle, and an end, *(i. e.)* should be complete in all its parts, not encumbered with adscititious incidents, which have no connexion whatever with the subject. Great action implies not only that the subject be sublime, but also noble and astonishing.

Q. 3.—State briefly what you remember of Addison's observations regarding the fable, the characters, the sentiments, and the language of the Paradise Lost.

A.—All the qualifications of a fable, which make it the proper subject for an epic poem, are found in the fable of "the Paradise Lost," *(i. e.)* it consists of one action. The subject of the whole poem is the temptation of man by the wiles of the fallen angels. Had the author begun his poem from the first revolt of Satan, and his expulsion from heaven; the unity of the story would have been lost. Milton, therefore, has, with great art, opened his poems with the assembly of the infernal legions. The rest of the story is related in his second and third books by way of an Episode. It is also entire; because it commences from the infernal assembly, where the temptation of man is at length decided, it continues through all the steps which Satan took to seduce man, and ends with the effect, *(i. e.)* the fall of man. It is also great; being contrived in hell, executed upon earth, and defeated by heaven. Its heroes are man in all his perfection, and woman in all her beauty. Its several characters are omnipotence, the great enemy of mankind, and the good and bad angels. The characters of the poem are suitable to the design of the work, and present throughout the same quality which is first ascribed to them. Satan everywhere preserves the same dignity, and the same pride. Everywhere he shows hatred, contempt, and aversion to subjection, as is suitable to an enemy of man and of God. Moloch is everywhere furious, warlike, courageous, and rash; Belial is effeminate, luxurious, fond of pleasure, slothful, and averse to activity. The characters are also real which implies no more than that they are probable. Except the personages of sin and death, every character represented in the play is

probable, as all the names have been taken from the Bible. The sentiments are both sublime, and suited to the different characters represented in the poem. Its language also is perspicuous and sublime, which is of essential importance in an epic poem. By making very little use of the idioms of his native tongue, and by introducing old and foreign idioms and words of his own coining, Milton carried the language of his poem to the highest state of perfection and refinement.

ESSAY ON BRITISH ADMINISTRATION IN INDIA.

BY THE SAME.

In remote ages, a commercial intercourse with India was carried on by Europeans through the Persian Gulf and the Red Sea, and consequently they had to pass through a long tract of countries in Asia. But the discovery of a maritime passage to India round the Cape of Good Hope facilitated, in a great measure, their commercial intercourse. The Portuguese, however, claiming the trade with India, as their exclusive right (being the discoverers of this passage), partly by presents and bribes to the potentates of Asia, and partly by intimidations to the weaker chiefs, obtained a firm footing in India, and established manufactories round the coasts. They therefore could not bear to part with the exclusive enjoyment of their right, which nevertheless was encroached on by other European states, particularly by the Dutch. The immense profits reaped by these states encouraged also the English and the French to open a commercial intercourse with India. But the trade of one hundred years, and the immense profits gained thereby, procured the Portuguese and the Dutch many allies in India. Hence it was impossible for one or two individuals to attempt so arduous an undertaking in opposition to the Portuguese. Consequently, it was necessary, that a company of wealthy merchants, who could procure a large treasure, and a sufficient number of troops, should be organized. For this purpose a Charter was granted by Queen Elizabeth in the year 1600, by which all who were desirous of trading with India, were incorporated in one company. By this Charter, the Company were empowered to transact all business connected with their trade, through an assembly chosen from among their own members, and composed of 24 Members and a Governor, called the Court of Directors. A tax upon all the goods exported by the Company was also established by this Charter.

This Charter, afterwards confirmed and remodelled by other succeeding monarchs, continued to be acted upon for sixty years, during which time the trade of the Company, though not very flourishing, was yet on the whole not so discouraging as to be abandoned. The Company during this interval met with much more opposition

than they had at first conjectured. Not only the Portuguese, the Dutch and the French with their allies in India offered their opposition; but even some English private individuals interfered with their commerce and opposed their progress. But the Company at length overcame all these obstacles, and had at last in 1666 A. D. eight colonies and factories established round the coasts of India, under two Boards; the one placed at Surat and presiding over the factories at Cambay, Ahmadabad, Goga and Calicut; and the other established at Fort St. George, or Madras, presiding over the factories at Hoogly and Masulipatam. In 1661, another Charter was granted to the Company by Charles II., granting them a power of exercising judicial as well as political authority over the colonies and their subjects in India, and also conferring on them a power of making peace or war with the native chiefs. But the sanguine expectations entertained by the Company of the progress of their commerce were for a time blighted, and the career of their prosperity interrupted. A rival Company was instituted by the Parliament entitled the "English Company of merchants for the East Indies;" while the former came to be denominated the "London Company." The old Company could match this wealthy corporation only on account of the long footing obtained by the former in India. At length after experiencing many reverses on both sides, a mutual agreement took place, and the two companies were incorporated into one body of merchants known by the name of the "East India Company."

Up to this time, one hundred years had elapsed from the institution of the first Company. They had obtained by purchase and by grants, some extent of territory near Surat, Fort St. George or Madras, and in Bengal. They had a jageer (besides 73 villages) granted to them by the Mogul emperor; they from time to time established many factories, and garrisoned forts. These advantages possessed by the Company were looked on with envy by the emperor Aurungzeb, who determined at length to drive away the English from India. But they were not easily to be displaced. They opposed the emperor with success; if they lost their territories in one place, they gained them in another. But at length, after long struggles, a peace was concluded by which the English retained all their former possessions in India. Although the English in India had at this time, a sufficient extent of territory, to be considered as one of the ruling powers in India, and a sufficient number of troops at their command, (besides a supply of troops from England and a great maritime power), yet they had no intention of governing the country, their thoughts were wholly directed to the progress of their commerce. They had in 1685, proposed to assess lands subject to their authority, for the purpose of maintaining a regular army for their defence. But the state of the country, and the anarchy that prevailed in those ages, invited them to take possession of the country which they were so unwilling to possess. The contending parties

sought aid of the English, and in return granted them jageers, which considerably augmented their territorial possessions. A rival Nuvab for the throne of the Carnatic implored the assistance of the English, and as a reward, granted them a large jageer. Frequent attempts of the Native chiefs to plunder the factories of the English, and to drive them away from India, forced them at length to subdue their enemies, and consequently brought them in contact with the French. Surajood-doula, the Nuvab of Bengal, oppressed the English, and taking Calcutta plundered the English factory founded in that City. He was at length, by the superior genius of Clive, defeated at Plassey, and the French force completely overthrown. After this battle all foreign enemies of the English were vanquished, and the English had solely to contend with the Native chiefs. Having been thus forced to conquer, and to govern, the English now bent their attention to the proper management of the country thus in their possession, and to frame new laws and regulations tending to the welfare of the subjects. The Parliament first intended to resume from the Company the Government of India, but finding no attempt on their part of oppressing the subjects, on the contrary, seeing their constant endeavour to promote the happiness of their subjects, they desisted from the attempt. In the year 1773, the Parliament passed a Regulation authorizing the King to appoint a Council of five or six members from among his Privy Councillors, and his Prime Minister to be appointed as President. This was called the "Board of Control." The same Regulation authorized the King to appoint a Governor General of India from among the ablest men of his Court. After every twenty years, new Regulations were made, until that passed in 1833, abolished the right of the Company of trading in India, and entirely changed them into a governing body. They divided all the British possessions in India into three Presidencies. That of Fort William or Bengal, of Fort St. George and of Bombay, each under its own Governor, but the Governor of Bengal had likewise an authority over the rest. But the English were not destined to be confined to these territories. The Marathas, the chiefs of Mysore, the Nizams, the Rohillas, the Pindarees, the king of Delhi, the chief of Bhurtpore, the Jats, and last of all the Siks, successively quarrelled with the English, and fell owing to their own folly; their dominions were incorporated into the English possessions; and these circumstances led to the complete possession of the whole of India by the English. From the preceding account, we may glean that the intention of the English was from the first very favourable to the natives of India. The exclusive right of trade enjoyed by the Company was also beneficial, for this prevented the rapid influx of the English settlers who would have have proved very injurious to the natives.

The Government of the East India Company, successively remodelled and improved by experience, has now been brought to perfection. This constitution has been established on the model of the

British constitution. A new Presidency, that of Agra, has been added to the three former. The great excellency in this constitution is that the ancient customs adapted to the natives of India, and the local administrations that were found to be good, have been retained, while the injurious ones were removed, and their imperfections supplied. The local administration of a district regarding revenue and boundary is conducted by a Collector, who is also invested with the power of a Magistrate. He is responsible to the Commissioner, who in his turn reports all matters to the Sudder Board, and the approval or denial of its decisions stands in the power of the Governor of the Presidency. These Governors are subordinate to the Governor General of India, who reports all matters to the Directors, whose transactions are inspected by the Board of Control. These last are subject to Parliament. Hence it appears almost impossible that any abuse should take place in the Government. The troops are managed by the Commander-in-Chief, who is subordinate to the Governor General.

Questions in Whewell's History of the Inductive Sciences, proposed to the Senior English Class, Benares College, and answered by Chundra Nath Mittra.

Question 1.—What, according to Mr. Whewell, was the primitive mistake in Greek Physical Philosophy?

Answer.—To the formation of sound physical knowledge, two things are requisite, *facts* and *ideas*, or collection of individual experiments, and the speculative faculty, to arrange, generalize, and form them into a body of science. The facts must be well ascertained, and the ideas, clear, distinct, and appropriate to the facts. According to some writers, the Greeks, like the Indian philosophers, neglected to collect facts, and dealt only with ideas. Mr. Whewell maintains that this is not the case, he says, that they neglected neither, and their failure is to be attributed only to their not applying appropriate ideas to those facts. For instance, in Herodotus' theory of the overflowing of the Nile, the father of history has employed the phrase, "the sun drawing water." If he had considered the phenomenon, and had possessed clearness and distinctness of ideas, he would then have come at once to the modern theory of evaporation, and would not have used the common notion of "drawing water." The acuteness, and the inventive genius of the Greeks failed completely, owing to this primitive mistake of not applying appropriate ideas.

Q. 2.—Who was the earliest great Astronomer among the Greeks, and what were his eccentrics and epicycles?

A.—The greatest Greek Astronomer was Hipparchus, a man of infinite assiduity in proving and verifying his theories. The Greeks had supposed that the heavenly bodies moved in regular circles, which of course did not agree with observation, as they continually made progress in them. Hipparchus, not being able at once to grasp the Keplerian theory, discovered another means by which he resolved the elliptical motion into the circular. He supposed the earth to be in the eccentricity of a circle, around which the sun moved in the circumference of another circle. In the same manner, he resolved the motion of the moon and the planets. The value of the theory is in its applicability to all the irregular movements of the planets. Even D'Alembert praises him for his perseverence.

Q. 3.—What was Ptolemy's Almagest, and how did it get that name?

A.—The next great Astronomer was Ptolemy. The name of his great work was Megiste Syntaxis, which in fact is an Encyclopædia of the Greek Astronomy. When the Arabians learnt the Astronomy of the Greeks, they translated this work of Ptolemy, and gave it the name of Almegiste. After the revival of learning, the Europeans retranslated the work, and its name was corrupted into Almagest.

Q. 4.—What was the character of the Arabian Astronomy as compared with the Grecian?

A.—The Arabians learnt, and only learnt the Astronomy of the Greeks. That acuteness and activity of thought, which so much distinguished the Greeks, was never possessed by the Arabs. Their intellect was barren. Not a single discovery (except that of the moon's variation by Abul Vufa) was made by them. They did not possess that desire of pursuing after truth, like the Greeks, but they served one important end, of saving the ancient works of learning from being lost.

Q. 5.—Give some account of Roger Bacon.

A.—Roger Bacon was the first who showed the true path of pursuing scientific investigations, some of his reflections resemble those of his name-sake. Lord Bacon's views were much more comprehensive. Some are of opinion, that Lord Bacon took his ideas from the works of Friar Bacon, and delivered them to the world in his own words. But the case is not so, and perhaps the resemblance between passages of their works is more a coincidence than any thing else.

Q. 6.—Give some account of Copernicus?

A.—To Copernicus the honour of discovering, or at least of establishing the heliocentric theory of the planetary system is due. In-

stead of following the ancient intricate system of Hipparchus, he tried to find a new one, which is much simpler. He learnt that Pythogoras and Anaximander held that the sun is the centre of our system. He tried and confirmed his theory by Mathematical reasoning and demonstrations. Instead of coming at once to the elliptical theory of Kepler, he still retained the notion of the circular motion of the planets and their revolution in eccentrics and epicycles. His discovery was the first that was made in Astronomy by modern Europe. His theory was further proved and improved by the efforts of his great successors Galileo and Kepler.

Q. 7.—What was the character of Kepler?

A.—Kepler's mind was extremely fertile, and his genius highly inventive. His perseverance was remarkable. He took up a certain theory, tried, and retried to prove it, and either gave it up after being convinced of its absurdity, or pursued, and at last to his great delight, solved and confirmed it. There is one thing in his writings, which is seldom found elsewhere, and that is his preserving the false theories, which arose in his mind, in discovering something, and the methods by which he got rid of them, so that in reading his works one may read the various thoughts that passed through his mind, which other discoverers either carefully conceal or think not worth preserving. With all his natural gifts he, unlike Newton and others, did not possess the faculty of quickly testing his theories, but went on with considerable labour, till he either became convinced of their truth or their fallacy. He was the discoverer of the theory of Elliptical orbits of planets. He first tried it with the orbit of Mars, the eccentricity of which is the greatest, and applying it to the other planets, did away afterwards permanently with the epicycle and eccentrics of Hipparchus.

Questions in "Norton's Rudiments" proposed to the Senior Class, Benares College, and answers by Ram Chunder Sen.

Question 1.—What is the meaning of the term Company, and the nature and objects of such an association?

Answer.—Any number of men associated together for some particular purpose, may properly be termed a Company, but the term has in its widest sense now come to signify those bodies, who bind themselves together by some mutual covenants or rules, for the purpose of carrying on some particular course of trade, manufacture, or com-

merce. The nature of private associations, whose main object is the pursuit of some sort of trading, would be too hazardous on a large scale. The thing which all companies have in common is the division and appropriation of shares among different individuals, according to the amount of capital necessary for the execution of the trade determined upon, and if these respective persons are not secured by some regulations from sudden dissolutions, and are responsible for the amount held by them, their zeal would be naturally weakened, and their hope and prospects be clouded. It is possible that some of the proprietors either wearied by the fatigue of anxiety, or ruined by losses natural to commerce, would leave their office of proprietorship, while others anxious of becoming free from their responsibilities would wish perhaps to divide their share among a number of other persons, and thus weaken the force of, or rather dissolve the partnership. These are casualties from which a large company should be secured.

Q. 2.—What was the origin and formation of the East India Company?

A.—Early in the 16th century, the Portuguese having entirely engrossed to themselves the trade of the East, they had sufficiently strengthened themselves by the possession of several strong and fortified places, and had become enormously enriched; they made themselves terrible to the natives of India under their settlements by whom they were readily obeyed. They thought themselves to possess the sole and exclusive right of trading with the natives of India, being a right which they claimed to themselves as first discoverers. The people of Portugal endeavoured by all means at their disposal, and even at a risk of some comparative loss to themselves to becloud the projects of all competitors who endeavoured to participate in a trade with the Indians. The inhabitants of England who boasted to be inferior to none in maritime affairs, thought themselves degraded in being thus checked from so lucrative an enterprize by a nation who could with great difficulty have maintained the rank of an independent state in Europe. They therefore resolved to open a communication with the east, which was by nature free to all mankind, but seeing their efforts fruitless against the Portuguese and the Dutch, (if undertaken on a small scale) who defied every other nation in India, they at length formed an association supported by the crown, and invested with express privileges, and by the Charter of 1600 granted to them by Queen Elizabeth assumed the name of "Company of Merchants of London trading to the East Indies." Another Company was formed in opposition to this Company in the year 1698, with fresh privileges granted to them by William III., but after mutual injuries a union was effected in 1707, which was termed "The English Company trading to the East Indies." This was subsequently in the year 1833, termed "The East India Company."

Q. 3.—Who are the component members of the East India Company?

A.—The component members of the East India Company are the proprietors, the Court of Directors, and the Board of Commissioners or the Board of Control.

Q. 4.—What are the powers of the Court of Directors and of the Board of Control?

A.—The powers of the Court of *Directors* are various. It has the legislative power. It directs and manages the affairs of the Company. It has the power of nominating all the Military and Civil Servants that are sent out to India. It is empowered to convoke general assemblies. It has the power of nullifying the acts, ordinances, and regulations of the Supreme Court of India, and it is among its duties rather than among its powers to hear petitions complaining of grievances, &c. The power of the Board of Control is to superintend, control, and direct, the acts, measures, and concerns, which in any way relate to the Government or Revenues of British India, It exercises a controling power over the affairs and conduct of the Court which concern the Company's Government in India. It is rather a controling, than an active body, for it cannot issue any measures. It promotes what is right, prohibits what is wrong, and enforces what is expedient.

Q. 5.—What are the qualifications of individual Directors?

A.—Every one wishing to become a member of the Court should at least possess £ 200. No one who has held office in India, or who has pecuniary accounts unsettled with the Company, or who has been accused of by the Court of general bad character, is fit to become a member of the Court, till he has resided in England for two years, or till such accounts with the Company be settled, and such accusations be satisfied. Also no one, but English-born subjects are capable of such an Office: foreigners may fill this office by being naturalized by an act of Parliament. The Directors are required to take an oath before their title can be valid.

Q. 6.—State briefly the provisions of the Act of 1773 and that of 1784?

A.—By the Act of 1773, the powers of the Company were curtailed; it was the first to appoint a Governor General in India, and the Act of 1784 was the first to appoint a Board of Commissioners or a Board of Control, the main object of which was to superintend the affairs of the Company. By the former Act, many alterations were made in the mode of conducting the affairs of India.

Q. 7.—What were the objects effected "by the first Charter Act?"

A.—The powers of the Board were confirmed by the first Charter Act of 1793, which lengthened the time of the Company for a period of twenty years.

Q. 8.—What modifications were introduced by the Charter of 1833?

A.—By the Charter of 1833, the right of the Company to trade in India was entirely abolished, and the mode of governing India was modified.

Q. 9.—Describe the constitution and composition of the Supreme Government of India, and of the subordinate Governments.

A.—The Supreme Government of India consists of the Governor General and four members. The appointment of the Governor General and one of the members who only has a casting vote in the legislative acts, needs the approbation of the crown to make them valid, but the three other members are nominated by the Court of Directors. The Governor General and one of the members are competent for every thing, except the passing of laws, in which case the Governor General and at least three members must be present. All proceedings are carried on in general Councils, and in case of the equal division of votes the Governor General has a casting vote. When the Governor General is absent on any business from the seat of Government, he may nominate the member approved of by the crown, and in case no such nominee be on the spot, he may name any of the other members, and in case no such nominee be present, he may name any person, Civil or Military, of ten years' standing at least. The Supreme Government has a controling authority over the other Presidencies. The Governor General is only allowed to nominate a Deputy in case he be absent. The Governments of the subordinate presidencies have no such power, they only have three ordinary members, and in case the Governor be absent, he may nominate a person of twelve years' standing at least in the Civil Service.

A

NOTICE

OF

THE SCHOOL AT SEHORE, IN BHOPAL:

DRAWN UP FOR THE INFORMATION OF THE HON'BLE THE LIEUTENANT GOVERNOR OF THE NORTH WESTERN PROVINCES, UNDER DATE THE 23RD SEPTEMBER 1850.

BY CAPTAIN J. D. CUNNINGHAM,

WITH

Some supplementary Remarks on the general question of Education in India.

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SUPPLEMENT.

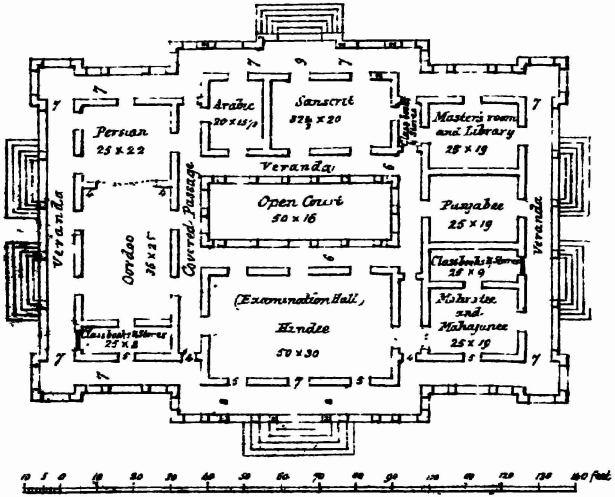
Some Remarks on the general question of Education in India.

PLAN OF THE SEHORE SCHOOL

Erected in 1847-49

On the part of the Begum of Bhopál & other Chiefs of Eastern Malwa, by whom & by the British Govt the School is endowed.

The school will accommodate about 700 boys. In 1869 the attendance was 561 and the regular income somewhat more than £1000 Rs per annum.



Cost — about 30,000 Rs
Walls brick & lime
Roofs — trussed & tiled
Verandas — arched fronts and flat roofs

Printed at the Secundra Orphan Press

A NOTICE OF THE SCHOOL AT SEHORE, IN BHOPAL.

[This Notice includes the substance and many of the details of a Report submitted to Government, under date the 18th April 1849.]

THE GENERAL OBJECTS OF THE SCHOOL.

1.—THE principal School is situated at Sehore, about twenty-two miles west of Bhopal, the former being the place of residence of the Political Agent, and the head-quarters of the disciplined Contingent maintained by the Bhopal State. There is a Branch School at Berseea, a small district belonging to the chiefship of Dhar, but managed by the British Government, and which lies about 36 miles north-east of Sehore.

2.—The object of the school is, 1st, to give to younger boys a full degree of instruction in reading one or another of the vernacular dialects, and also in writing and arithmetic; 2nd, to give to lads somewhat older a fair comprehension of the leading truths of the more useful branches of modern knowledge through the medium of the spoken tongues; and 3rd, to afford to young men the means of acquiring an accurate acquaintance with the elements at least of their own particular Law and Philosophy in the learned languages of their own race or creed.

3.—The vernacular or provincial dialects taught are primarily the Oordoo and Hindee, and secondarily the Marathee and Punjabee. The learned languages are Sanscrit, Arabic and Persian, if the last can properly be so regarded among the Mahometans of India. The Hindee is that of the upper Ganges and Jumna, as it may be considered the standard variety of that tongue between Hurdwar and the Nerbudda. A place is given to Punjabee, as there is a colony of Sikhs in Bhopal, many of whom are soldiers in the Regular Contingent, and as the school receives a large contribution from the funds of that force. Marathee again is the common language of business in the adjoining territories of Sindhea, Holkar and the Powars, and it is moreover of comparatively easy attainment from its similarity to the Hindee, and from the circumstance that it contains several useful books printed in

the Nagree character. This, combined with the want of funds, has hitherto prevented the formation of a separate Marathee class; and the dialect itself, but not the written character, is at present taught, as far as is necessary, along with the Hindee. The instruction in Punjabee and Marathee is intended to comprize simply a knowledge of reading and writing, the design being that the boys, after mastering their mother tongue, shall join the Hindee or Oordoo classes to learn History, Geography, &c., and the higher branches of Arithmetic. Similarly the scheme steadily kept in view embraced the formation of a department for teaching Muhajunee, in the hope that lads after learning what is necessary for their livelihood, might be tempted to acquire something more than their narrow utilitarian education usually embraces; it was likewise in contemplation to form an elementary English class, in which boys might learn to read and write that language with sufficient fluency and correctness to enable them to serve in public offices, but the hope of establishing a department of English Literature and Science was remote, as the funds of the Institution would require to be more than doubled in order that the services of a gentleman and a scholar, might be secured. Without ample means, and without the superintendence of a person of high character and attainments, it is hardly advisable to attempt to do more in English than to qualify young men for becoming copyists and book-keepers.

HISTORY OF THE SCHOOL.

4.—The school was set on foot on the extension of our supremacy over Malwa in 1818, by Major Henly, the first Political Agent at Bhopal, and it was maintained by him and by his immediate successors, Sir Herbert Maddock and Colonel Alves, out of uncertain funds, and by employing one or more members of the agency establishment in the task of teaching. Mr. Wilkinson, who followed the above named gentlemen, entered warmly and successfully into the cause of education, which both among Mahometans and Hindoos, was in a very backward state in Central India, and in 1832, the Bhopal and some other chiefs within the agency* agreed at his instance to contribute regularly towards the support of a higher description of school, while the British Government voluntarily offered a proportionate sum for an

* The principal chiefs whose possessions lie *wholly* within the Bhopal agency are the following :

1st Bhopal.—Rev. 22,00,000 Rs. The family Puthans, immediately dependent on the British Government, and now paying a tribute of two lakhs a year for the maintenance of a contingent force.

2nd Rajgurh.—Rev. 2,25,000 Rs. Powar Rajpoots, tributary to Sindhia.

3rd Nursingurh.—Rev. 3,00,000 Rs. Powar Rajpoots, tributary to Holkar.

4th Koorwaee.—Rev. 70,000 Rs. Puthans, holding direct of the British Government.

object of admitted importance. The matter however dropped for three years for reasons not very clear, but in 1835, the chiefs commenced the payments of stated sums, and in 1836, the British Government again agreed to subscribe at the same rate as the Nuwab of Bhopal, but for three years only, after this period the certain income of the School amounted to Bhopal Rs. 2380 per annum, as noted in the margin, *(a)* but the occasional donations were also considerable, and Mr. Wilkinson further added to the income of the Teachers from his own means, so as to render their circumstances easy. The subscription of the British Government was renewed for another three years in 1840, and an addition of Rs. 240 was made to the amount as a contribution towards the foundation of scholarships, such being deemed essential by Government to every scheme of instruction. Mr. Wilkinson died in 1841, leaving a name which will long be fondly remembered by the lovers of knowledge in Central India, and an example of devotion to the extension of education which cannot be too closely followed by every British representative. Mr. Wilkinson acquired a fair knowledge of Sanscrit, and he was so much struck with the difference between the science of scholarly brahmins and the cosmogonies of the popular belief, that he strongly advocated the adoption of the "Sidhants" as class-books, on the plea that their teaching was rational, and their authority established.—*(Journal Asiatic Society Bengal, III. 504, &c.)* Mr. Wilkinson somewhat overrated the importance of the Sidhant treatises as direct vehicles of teaching, and he devoted himself perhaps too much even to one branch of Sanscrit, but the sincerity of his conviction, his earnestness, and his persevering efforts to show that mathematical deductions were the same in the east as in the west, not only gained the confidence of the people, but won for him the enviable reputation of being the successful introducer of the higher branches of education into Central India.

	Bhopal Rs.
(a) The British Government, (Company's Rupees 800), or	880
The Nuwab of Bhopal, ...	800
Rajah of Rajgurh, ...	200
Rajah of Nursingurh, ...	200
Nuwab of Koorwaee, ...	150
Rajah of Kilcheepoor, ...	150
Total Bhopal Rupees,	2380

5.—Captain Trevelyan succeeded Mr. Wilkinson, but the death of the enthusiastic student and enquirer was felt in the school which

5th Kilcheepore.—Rev. 60,000 Rs. Keetchee Rajpoot, tributary to Sindhia. The chiefships comprize half the agency, the other half includes districts belonging to Sindhia, Holkar, Dhar, Deewass, and Tonk, and to petty jageerdars.

soon declined, and seemed likely to break up altogether, when at the end of the second period of three years, the Government subscription was discontinued. In 1844 Sir Claude Wade, the then Resident of Indore, recommended the renewal and increase of the contribution by an assignment on the revenues of Berseea (managed for Dhar by the Political Agent), equal to Rs. 1200 a year. To this application, however, no answer appears to have been given. Towards the end of 1844, Mr. Hamilton, who succeeded Sir Claude Wade at Indore, urged a continuance of the Government support, and a disbursement of Rs. 50 monthly, or 600 a year, has since that period been regularly sanctioned. This mark of continued interest in the welfare of the school reminded the chiefs of what was proper on their parts, and assured the community, that the impulse given by Mr. Wilkinson would yet be followed up by the British Government, and by the rulers and nobles of the province.

6.—In 1846, I succeeded to the Bhopal Political Agency, and among the first objects which engaged my attention was the welfare of the School. Some of the masters introduced by Mr. Wilkinson still remained, the impress created by him in favour of education had not disappeared, and the Government and the chiefs continued their countenance and pecuniary support. The methods of instruction however were desultory and unsystematic, the certain income was insufficient, and two separate buildings were in use, the one confined and ill planned, and the other mean in appearance, as well as small and incommodious. I first set about the regulation of the course of instruction to be followed, and of the number and kinds of books to be read, so as to produce a conformity of method and a corresponding degree of progress or of attainments in the two principal vernacular branches. After consulting with Dr. Sprenger, the learned Principal of the Dehlie College, and with Mr. Middleton of Agra, I laid down a scheme which interested the Council of Education, and which was favourably noticed in the General Report on Public Instruction in the North Western Provinces, for 1846-47. As the details of the subjects now taught are given in the Appendices, Nos. IV. to VIII., and do not materially differ from the scheme first set on foot, it is not necessary to recapitulate them here.

7.—Having thus re-organized the system of teaching and endeavoured to infuse a new spirit into Masters and Scholars, I felt I could explain my views to the several chiefs with good reason, and with fair hopes of success, I reminded them among other things of an old promise, they had made to Mr. Wilkinson, about increasing their sub-

scriptions, as the school became extended, and they at once aded somewhat more than a third to their original contributions as noted in the margin,* so that notwithstanding the diminution of the Government aid, the certain income of the school was raised from Rs. 2380 to Rs. 3210 per annum. At the same time, the chiefs expressed their willingness to go hand in hand with the British Government in extending the means of education, and they likewise said they were ready to contribute towards the erection of a suitable building worthy of the cause, and of the returning prosperity of the Institution. I took this favourable opportunity of bringing to the notice of Mr. Hamilton, the Resident at Indore, the circumstance that the sons of many soldiers in the Bhopal Contingent Force received a valuable education free of charge, and that as the school served for Regimental, as well as general purposes, it seemed but fair the funds of the force should contribute towards its maintenance. Mr. Hamilton, whose active interest in promoting education is well known, at once sanctioned an assignment of Rs. 200 a month, and the income of the school was thus raised to Bhopal Rs. 5610 per annum.

* *Certain subscription in* 1846-47, *(Sehore School.)*

	Bhopal Rs.
The British Government, (Co.'s Rs. 600), ..	660
The Begum of Bhopal, ...	1200
The Rajah of Rajgurh, ...	400
The Rajah of Nursingurh, ...	500
The Joint Chiefs of Koorwaee, ...	200
The Rajah of Kilcheepoor, ...	250
Total Bhopal Rupees, ..	3210

Total Income of the Sehore School in 1846-47.

	Bhopal Rs.
As above, ...	3210
From Bhopal Contingent Fund, ...	2400
Total Bhopal Rupees, ..	5610

8.—With means thus more than double, the school soon rose in efficiency and in popular estimation, two of the principal teachers employed by Mr. Wilkinson returned to their old posts, the stock of books was increased, and the foundations of a large and commodious building were laid. In the spring of 1848, the regent Begum of Bhopal encamped at Sehore, partly for the purpose of settling the revenue and remodelling the police of the pergunnah, and as Her Highness was joined by several of the chiefs of the Principality, the affairs of the school were discussed at length, its increasing value was admitted, and the offers of further aid in developing it were freely made. A correspondence was at the same time entered into with the other

chiefs of the agency on the subject, and the result was, that the annual contribution was, a second time further increased by more than a third, as noted in the margin,* so that the certain income of the school became equal to Bhopal Rs. 7260 per annum. The site and foundation of the new building were at the same time inspected, the plans and estimates were examined, and preliminary subscriptions amounting to Rs. 21,500 were at once given on the understanding that any additional expenses would likewise be provided for by further subscriptions. In the meantime, several young brahmins of respectability had joined the school, while those brought up in it had advanced considerably in their studies, and I was accordingly glad that an opportunity offered of entering freely into the subject of Sanscrit studies, and into the merits of the different vernacular renderings of English science with Dr. Ballantyne of Benares, who, to experience and scholarly knowledge, adds a just appreciation of the Indian intellect and of the literary achievements of the ancient brahmins; with Dr. Ballantyne's aid I procured several useful books known only by name in Malwa, and acting upon his suggestions, I materially improved the course of study to be followed.

* *Income of the Sehore School in* 1848-49.

	Bhopal Rs.
The Bhopal State,	2000
The Rajah of Rajgurh,	600
The Rajah of Nursingurh,	800
The Joint Chiefs of Koorwaee,	400
The Rajah of Kilcheepoor,	400
Total Bhopal Rupees,	4200
Add British Government,	660
Bhopal Contingent Fund,	2400
Grand Total Bhopal Rupees,	7260

Contributions towards the erection of a new School at Sehore in 1848.

	Bhopal Rs.
The Bhopal State and the principal Jageerdars,	10500
The Rajah of Rajgurh,	1500
The Rajah of Nursingurh,	2500
The Nuwab of Koorwaee and his brother,	1000
The Rajah of Kilcheepoor,	1000
Total Bhopal Rupees,	16500
Add Bhopal Contingent Fund,	5000
Grand Total Bhopal Rupees,	21,500

9.—In 1849, arrangements were entered into with the Bhopal State for fixing the amount to be provided for the maintenance of a disciplined Contingent, agreeably to the spirit of the original treaty, and as the funds of the force were thereby increased by nearly a

third, the contribution towards the support of the school was at the same time raised to Bhopal Rs. 3000 a year. Still the income seemed less than was desirable, even for the then educational demands of the district, and the cost of the new building seemed likely to amount to Rs. 30,000 instead of 25,000, as had at one time been hoped. The regent Begum of Bhopal however at once came forward, and added Rs. 500 to the annual subscription of that State, and made a donation of Rs. 5000 to the new School, which added to some accumulations and to the extra contributions of the other supporting chiefs, would fully cover the supplemental estimate, which might reasonably be expected to be near the truth, as the building was almost completed. The regular income was thus raised to Bhopal Rs. 8360 a year, as detailed in the margin,* or including Rs. 438, the fluctuating personal contribution of merchants and others at the particular time to a total of Bhopal Rs. 8798 per annum.

	Bhopal Rs.
Estimated Total Cost of the new School-house duly provided for in 1849, ...	30,000

* *Income of the Sehore School, in* 1849, *as left by Captain J. D. Cunningham.*

	Bhopal Rs.
The British Government, ...	660
The Begum of Bhopal, ...	2500
The Rajah of Rajgurh, ...	600
The Rajah of Nursingurh, ...	800
The Nuwab of Koorwaee and his brother, ..	400
The Rajah of Kilcheepoor, ...	400
The Bhopal Contingent Fund, ...	3000
Total Certain Income, ..	8360
Add, individual Subscriptions of Merchants and others, ...	438
Grand Total Bhopal Rupees, ..	8798

10.—The new school forms a hollow rectangle, 150 feet one way and 110 feet the other, four separate ranges, each comprising one or more rooms, are so combined as to be near one another, and to communicate by means of covered passages and verandas. Externally the whole building is surrounded by an arched veranda. The walls are of brick and lime throughout, and the roofs are trussed to avoid the incumbrance of sustaining pillars. The largest room measures 50 feet by thirty internally, and this, with its adjuncts, will accommodate all the boys studying Hindee, and form at the same time a convenient Examination Hall. There are separate compartments for each of the other languages, and a fair-sized room has been provided for a library, which, it is hoped, may be gradually formed. The room will also serve for the masters to meet in to adjust questions referred to them or for other purposes. The building was not wholly finished until after I had left Bhopal, but it was opened for use and with some degree of ceremony by the Regent Begum and by Major Durand, the Political

Agent, early in the present year. Under a person of Major Durand's tastes and acquirements, there is nothing to be apprehended with regard to the continued prosperity of the school, which must always depend in some degree on the disposition of the British Authorities.

11.—A suspicion may perhaps arise that an undue use was made of the influence of the British Government in obtaining subscriptions for the support of the school and for the erection of the new building; and doubtless were it thought that the paramount power was averse or indifferent to the cause of education, the chiefs as a body, would not of themselves press their money upon the Political Agent for any purpose of general utility, but knowing as they do, that the Government is bent upon the diffusion of useful knowledge, and seeing as they do, the British representative intent upon giving effect to these views, they cheerfully contribute towards the attainment of a great end. Their reason assures them of the absolute value of knowledge and truth, the better feelings of their nature admit the beneficence of instructing their fellow-countrymen, money so spent has in their eyes the religious merit of charity, and their pride and vanity are equally gratified by the applause of the ruling power and by the increase of reputation which they acquire in their own province. It was thus a kind of fashion to contribute to the school, and I confess that I so far encouraged the desire, as to expatiate on the advantages of education, and to spare neither time nor trouble in rendering the institution worthy of the liberal support it latterly received, especially on the part of Bhopal, the high public spirit of the regent of which State is well known throughout Malwa, and is fully appreciated by the Supreme Government.

12.—The progressive increase of the school may be satisfactorily seen in the number of boys and young men who have from time to time attended it. In 1832, Mr. Wilkinson reported that there were then eighty (80) students. In 1839, he reported that the scholars had risen to 228, but in 1844, when Mr. Hamilton visited Bhopal, the boys had fallen to 175. In 1846, after the introduction of new methods and the augmentation of the income of the school, the attendance rose to 300. In 1849, the students mustered 541, or more than double, what Mr. Wilkinson had witnessed. The new building can accommodate about 700 in all, to which number it may be convenient to limit the scholars. An abstract is given in the margin* of the different creeds of the students in 1849, and further particulars as to numbers of different races, and as to the classes they attend, may be learnt on reference to Appendix No. III.

Scholars in 1849, (*Sehore School*).	
Hindoos, ...	291
Mahomedans, ...	177
Jains, ...	25
Sikhs, ...	48
Total, ..	541

THE BRANCH SCHOOL AT BERSEEA.

13.—The Branch School at Berseea, has a certain income of twenty-two (22) Bhopal Rupees monthly, or Rs. 260 per annum, being the amount of the Government subscription. The fund however had been raised in 1849 to Rs. 860 a year, by uncertain contributions, while books were furnished from the Sehore School. The instruction given in the Branch School is elementary only, but it includes a correct knowledge of Oordoo and Hindee, a sufficient acquaintance with Persian for ordinary business, and a facility in casting and in keeping accounts. In 1849, the scholars amounted to 141 as noted in the margin,* and further particulars as to the race and religion of the boys, and regarding the establishment of teachers may be seen on referring to Appendices Nos. I. and III.

* *Scholars in* 1849, (*Branch School at Berseea*).	
Hindoos,	101
Mahomedans,	27
Jains,	13
Total,	141

COMPARISON OF THE SEHORE WITH OTHER SCHOOLS.

14.—The total number of boys receiving instruction at the Sehore School, and its Branch at Berseea, thus amounts to 682,* but to judge fairly of the Institution, it is necessary that it be compared with others, which are either directly supported by the Government, or which derive a considerable income from regular endowments, and many of which have the advantage of possessing European Teachers and English Scholars as Principals, who can devote their whole time to the cause of education. On referring to the statements given in the margin,† and which are derived, the one from the Report on Public Instruction, North Western Provinces, for 1846-47, and the other from the Report on Public Instruction in the Lower Provinces of Bengal, for 1847-48, it will be seen that the Sehore School has more students than any Institution away from Calcutta; and although it may be objected that at Sehore instruction of a very elementary kind is afforded to many boys of tender years, yet it may be observed, that there are several youths well advanced, and who aim at a high degree of knowledge of Arabic and Sanscrit Literature. The Sanscrit Department in especial promises to be strong, as its two teachers are competent men, one indeed is perhaps the most learned brahmin in Malwa, and as there is a leaning towards the cultivation of the ancient

* *Scholars in* 1849, *at Sehore and Berseea.*	
Sehore,	541
Berseea,	141
Total,	682

† *Students in Schools and Colleges, North Western Provinces,* 1846-47.	
Ghazeepoor,	128
Benares,	209
Saugor,	175
Jubbulpoor,	190
Bareilly,	256
Agra,	378
Dehlie,	334
Students in Schools and Colleges, Lower Provinces, 1847-48.	
Calcutta Hindoo College,	557
Calcutta Mahomedan College,	248
Hoogly College,	683
Dacca College,	283
Midnapoor School,	120
Kishnagurh School,	255
Patna School,	59
Burdwan School,	60

literature of the country. Again, with respect to the local support given to education, it appears that in the Upper Provinces, (Appendix II. Report of 1846-47), the subscriptions of living people, amounted to Rs. 119 only, viz., to Rs. 110 at Bareilly and to Rs. 9 at Dehlie; for the *bequests* made to the Dehlie College, for instance, have scarcely the merit of annual payments. The Report on Public Instruction in the Lower Provinces for 1847-48, does not specify the local subscriptions to schools in Bengal Proper. At Sehore, the tolerably certain or permanent individual contributions amounted in 1849 to Bhopal Rs. 438, besides the varying but customary contributions on examination days, and the occasional donations of visitors together, sometimes added Rs. 2000 to the income of the School.

PROPOSAL FOR INCREASING THE EFFICIENCY OF THE SEHORE SCHOOL.

15.—The Sehore School has now indeed fairly rooted itself in the minds of the chiefs and people as an Institution of the highest utility, and as inseparably connected with their notions of British protection and supremacy. It is this circumstance which gives to the School a peculiar character and which renders it an instrument capable of being used for the best ends, not only of literary instruction, but of firm and enlightened Government. It is no longer a mere local School for helping lads to earn their daily bread, by teaching them how to read and write their rude mother tongue, or by giving them a smattering of Persian, but as it draws young men from every town round about to obtain an acquaintance with the truths of modern knowledge to study the higher branches of their own literature, and to have the advantage of a regular and pleasing kind of intercourse with the British representative, it becomes the immediate means of diffusing correct notions of the material world, and of impressing upon the minds of the people the high and beneficial aims of their foreign but civilized masters. The School has, I consider, a general as well as a local, an imperial as well as a municipal value, and it would doubtless strengthen our supremacy as well as add to our good name if the direct support of the paramount power could be further extended to it. In April last year, I submitted two propositions on the subject which involved an increase of subscription on the part of the British Government, and likewise on the part of the Chiefs, including the Rajah of Dhar, as proprietor of Berseea. The Rajah of Dhar had however just established a school in his own capital, and it was not thought advisable to appeal to him on the subject, while it is to be feared that the funds at the disposal of the Council of Education will not admit of any addition to the Government contribution, although in 1832, the intention was expressed of making the British subscription equal to that of the Bhopal State. The minor scheme is given in detail in Appendices X. and XI., and as it does not require more from the supreme power than Co.'s Rs. 3000 a year, nor from the Rajah of Dhar than Bhopal Rs. 600, it is hoped that it may yet be acquiesced in. The plan laid down would give the masters such salaries

as would render them satisfied with their position, and the school would otherwise be put on a footing of completeness and efficiency which would render it as independent as is desirable of the countenance and character of the British Agent on the spot. Hereafter when the Institution may fairly be regarded as the superior school of instruction in the Bhopal Agency, or as the provincial College of Eastern Malwa, the Maharajas Sindhia and Holkar, the Rajah of Dewass and the Nawab of Tonk, all of whom have districts within the particular circle of superintendence, may reasonably be expected to contribute towards its support. Until however the British Government is able to set aside a fixed proportion of revenue for district Schools and provincial Colleges, it may be difficult to require dependent chiefs to do so.

MISCELLANEOUS OBSERVATIONS CONNECTED WITH THE SYSTEM FOLLOWED IN THE SEHORE SCHOOL.

16.—Many matters of detail relating to the system in force in the school at Schore may be learnt from the Appendices, giving the strength of Establishments, the course of studies, and the more important of the Bye-laws. There are other points however which have a general bearing, and which I will proceed to notice.

Relating to Religious Instruction.

17.—Direct religious instructions is not afforded to any of the scholars, that is, the Scriptures which are believed to be revelations are not admitted as class-books. But as much of the literature, and many of the civil institutions and social usages of every people are based upon their theology, it was not thought necessary to exclude expositions of morality or of law, or even imaginative productions which adopted entire the mythology of popular belief. The "Korân" is thus excluded, but notwithstanding the example of Bombay the "Bhagavut" is perused, for it does not take its place with the Veds as directly inspired by God. In the superior classes of the higher departments it was rather indeed wished that metaphysics or the philosophy of either of the principal creeds, should be taught along with the pure sciences, and no apprehension was felt that this combination of pliant Logic and rigid Geometry would ever lead to any evil consequences. Educated Mahometans and Hindoos are sufficiently tolerant of one another's hereditary persuasions, if arguments are the only weapons used, and in scholastic speculations reason rather than authority is the common criterion.

Relating to false Sciences.

18.—Similarly no instruction has yet been given in the pseudo-Science of Astrology, although I was frequently inclined to relax so far as to allow young men who had mastered the principles of Astronomy, to learn

the empirical Mathematical rules by which nativities are cast or fortunate moments predicted. We know that Kepler admitted, while he lamented the utility of Astrology to Astronomy, and that towards the end of the 17th century, Flamsteed could calculate the horoscope of Greenwich without prejudice to the accuracy of his celestial observations. Our students still devote themselves to Homer and Virgil, to Plato and Cicero, without a fear that fanciful mythology or metaphysical doubts will vitiate the Christianity of the rising generation. It is even a fashion to aid the doctrine and the morality of the Gospel by a recourse to the mysteries of Freemasonry, and if we thus defer to the traditions and credulity of our rude ancestors, we may perhaps yield something not only with impunity, but with advantage to the superstition of our half-barbarous subjects, and let meaningless "aspects and configurations" minister to the reception of genuine Astronomy, our only means of introducing our knowledge are argument and example, we should not needlessly work against the grain, as it were, and we may fall in some measure into the imperfect ways of those we are among, without sacrificing either consistency or truth, if we keep steadily in view the great end of finally relieving them of the incumbrances of sheer error and popular prejudice.

Relating to Examinations.

19.—An annual examination of the school was held usually on the visit of the Resident at Indore, or of some of the surrounding chiefs during the cold season. The presence of the leading men of the country gave distinction to the occasion, and was equally pleasing to the masters and to the scholars. The examination commonly lasted two days, and was concluded by a distribution of prizes which hitherto have consisted almost solely of money, although it was intended to give books and instruments or other objects of utility as soon as a uniform supply of suitable articles of the kind could be insured. The merits of the boys were determined partly by the answers they gave on the examination days, and partly by the positions they had held in their classes throughout the year, and which were registered weekly after a partial examination of the boys by their respective teachers.

Relating to visitations and to intercourse with the Masters.

20.—It was my custom to visit the school regularly once a week, viz., on the mornings of Thursday, when a revision was made of the progress of the preceding six days, one or more classes were examined by me or in my presence, while others were being examined apart, and the places of the boys were entered in the weekly reports to be preserved for reference on the annual examination. On the afternoons of Friday, I usually received all the masters, accompanied by the beneficiaries and monitors at my own house. Any matters connected with the discipline or the wants of the school were then settled, the weekly reports of progress

were signed, or as the month came round, the periodical reports of attendances of books and stores received, worn out, still in use, or lost, or destroyed, were inspected, and afterwards until evening set, in any subject of passing interest, or some question of science or history or manners, would be discussed generally by the senior masters, and with or without my aid. These regular visits to the school, and these conferences in my own house, I found of great value in infusing a spirit of emulation among the boys, and in raising the character and the importance of the masters and of the institution in the opinion of the public. Similarly, when ceremonial visits were paid to or by chiefs of rank, some three or more of the principal masters had places assigned to them in the "durbar," while to encourage the boys it was arranged that five or six of those who had passed through the whole of the classes of the Persian or Hindee Departments, and who remained to improve themselves still further, should work half of each day in the agency office, and receive a small salary for their maintenance. Others again I would send along with members of the agency establishment proceeding on any separate duty, in order that they might become initiated to business. By these and similar methods, both that degree of confidence was inspired, and that kind of encouragement given, which are necessary to the success of new systems.

Relating to caste.

21.—Considerable difficulty had originally been experienced and some will always exist, in inducing boys of good family to join the school, owing to the mixture of races and the large proportion of scholars of comparatively low caste who sought instruction. No rule is in force which excludes any caste, but practically those regarded as unclean do not ask for an admission which it might be necessary to refuse them. There was an instance indeed in the Sikh school, in which the sons of a sweeper convert, who had become a trader, were among the most forward scholars, but yet had to learn their lessons seated aside. In the Hindee school, again, a "telee" or boy of the oil-seller caste or following, distinguished himself, and would have made a very useful under-master, but I found it inexpedient to advance him in that way, and he had to be satisfied with an inferior appointment. In the Persian school also, the son of a Mahomedan butcher was one of the best scholars, and it was the young man's wish to remain attached to the school. Opinion however compelled him to renounce all intention of following his father's trade, and obliged his father to dedicate him as it were to learning, but this being understood, he was welcomed as the salaried Curator of Books. On the whole, the repugnance of the better classes to a miscellaneous school is being gradually overcome, and now that a large and commodious building has been erected many of these objections will cease, as there are divisions for different languages and sufficient space to allow of as much separation of classes or sections of classes as is required.

Relating to instruction and printed books free of charge.

22.—Hitherto no charge has been made for instruction, and attendance has further been encouraged by assigning stipends or "benefices" for certain periods to a limited number of the higher scholars, by paying monitors for fixed periods, and also by allowing small sums as maintenances to a limited number of poor boys in each department. Further, printed books are furnished free of cost to all parties, but in the Sanscrit school, manuscript copies are procured or prepared by the boys themselves. In the lower Departments the poorest lads are supplied with paper for exercises and copy books, but the great majority furnish their own stationery of the prescribed quality and size. In time it is expected that first a proportionate and eventually a full charge may be made for books. By and bye also, entrance fees may be required as preliminary to annual payments, but there should be no hurry in introducing such measures, as the school has the character of an endowed Institution in which instruction itself is commonly thought to cost nothing.

Relating to the Branch School at Berseea.

23.—In the Branch School at Berseea, the same system prevails, so far as is applicable, as that which obtains at Sehore. The amil visits the school at least once a week, and on Thursdays, he examines one or more classes; the same books are read, the same arrangement of classes, so far as they go, has been made, the same kind of reports or returns are furnished, and the boys have the same kind of inducement to exertion, viz., office employment, paid monitorships and annual prizes. The Political Agent holds an annual examination in the presence of any chiefs who may be with him. The masters themselves are eligible for promotion in the Sehore school. The gross revenue of the little district does not exceed Rs. 70,000 a year, and thus the attendance of 141 boys is satisfactory. The school indeed is efficient and useful, and it only requires an adequate fixed income to render all parties satisfied with its permanence, and with their own prospects.

Regarding some of the masters and others.

24.—I am induced by pleasing recollections to say a word or two in conclusion regarding the principal teachers and some others connected with the school. Moulvee Mahomed Nawaz, the Head Master in the Arabic and Subordinate Departments, was brought up at the Dehlie College, and was appointed to his present situation by Mr. Wilkinson. He quitted Sehore for a time, but I had little difficulty in inducing him to reoccupy his old place. He is a man of good family, fair acquirements, and considerable weight of character. The master, Syedooddeen, immediately under him, is likewise a native of Upper India, but he was brought up at Sehore, and he is an efficient instructor. Mr. Wilkinson induced a pundit, by name Sewa Ram,

to quit Benares, to teach the higher branches of Astronomy, but soon after the decease of that gentleman he obtained temporary employment elsewhere. He however also returned to Sehore, but as in the meantime two of his pupils had surpassed their master in knowledge, and as he had little weight of character, no suitable provision could be made for him, and he retired to his native place with a pecuniary gratuity. He deserves however the praise of having introduced a knowledge of the higher Astronomy into Malwa. His two pupils referred to, viz. Pundits Somnath and Chumpa Ram, are now the teachers in the Sanscrit Department. Somnath is a man of capacity, moderation, and industry, who is intent upon obtaining a critical knowledge of the whole circle of Sanscrit Science and Literature, and a fair comprehension of the Mahometan and Christian religions, and metaphysical systems. He has compiled a useful abstract of Brahminical learning, omitting however the purely mathematical portions. His brother scholar and teacher, Chumpa Ram has a strong turn for mathematical pursuits, and he is a very efficient instructor in the "Sidhant Section." The head teacher of the Hindi School, pundit Rutneshwar, was a most valuable coadjutor of Mr. Wilkinson's. He entered heartily into the scheme of grafting English results on Indian principles or admissions, and his ideas were further extended by visits to Bombay and Agra, still he is not equal in attainments or capacity to others named above, but he does his duty efficiently and earnestly. The Master, Pundit Dowlut Ram, immediately under him was brought up in the school, and is possessed of good abilities. Of others not actually attached to the school, there are three still living who deserve mention. The brahmin Oonkar Bhut, belonged to the Agency Establishment, but he also fell into Mr. Wilkinson's views, and rendered himself useful by putting the outlines of our modern Geography and Astronomy into an Indian dress. Bapoojee Pundit, was attracted to Sehore by Mr. Wilkinson's reputation, and he received occasional employment. He is a man of great acuteness and varied acquirements, but failing eyesight, has induced him to retire to Benares. Pundit Bapoo Deo was likewise brought to Sehore by the reports of Mr. Wilkinson's learning and liberality, and he soon added to his accurate and extensive knowledge. He is now at Benares, and Dr. Ballantyne frankly acknowledges that the pundit most materially aids him in rendering his physical and metaphysical abstracts idiomatically and scientifically correct in the Sanscrit language.

(Signed) J. D. CUNNINGHAM.

Simla, 23rd September 1850.

APPENDIX I.

Establishment of the School at Sehore and of the Branch School at Berseea.

1st—Sehore.

General.	*Bhopal Rs.*	
1 Jemadar, ...	7 0 0	
3 Sipahees, @ 5,	15 0 0	
2 Furrashes, @ 4,	8 0 0	
1 Bheesty, ...	5 0 0	
Allowance to Sweeper,	2 0 0	
Allowance for oil for lights, ...	2 0 0	39 0 0
Arabic, Persian, Oordoo.		
1 Head Master, ..	70 0 0	
1 Second Master, ..	45 0 0	
1 Third Master, ..	30 0 0	
1 Fourth Master, ..	20 0 0	
1 Fifth Master, ..	18 0 0	
1 Sixth Master, ..	15 0 0	
2 Beneficiaries, Arabic one, @ 5, and one @ 4, ...	9 0 0	
4 Monitors, Persian, @ 3, ...	12 0 0	
2 Maintenances to 2 Pupils, Arabic, @2,	4 0 0	
10 Maintenances to 10 Pupils, Persian and Oordoo, @ 1,	10 0 0	
1 Curator of Books, &c., ...	15 0 0	
1 Duftry, ...	6 0 0	
Stationery, ...	5 0 0	259 0 0
Carried over, Rs., ..		298 0 0

	Bhopal Rs.	
Brought forward, ..		298 0 0
Sanscrit.		
1 Head Master, ..	50 0 0	
1 Second Master, ..	45 0 0	
1 Beneficiaries, 2 @ 5 and 2 @ 4, .	18 0 0	
6 Maintenances to 6 Pupils, @ 2, ..	12 0 0	
1 Curator of Books,	10 0 0	
Stationery, ...	4 0 0	139 0 0
Hindee.		
1 Head Master, ..	60 0 0	
1 Second Master, ..	40 0 0	
1 Third Master, ..	30 0 0	
1 Fourth Master, ..	20 0 0	
1 Fifth Master, ..	18 0 0	
1 Sixth Master, ..	15 0 0	
4 Monitors, @ 3 ..	12 0 0	
10 Maintenances to 10 Pupils, @ 1 ..	10 0 0	
1 Curator of Books,	15 0 0	
1 Duftry, ...	6 0 0	
Stationery, ...	5 0 0	231 0 0
Punjabee.		
1 Master, .. .	20 0 0	
1 Monitor, ...	3 0 0	
3 Maintenances, @ 1	3 0 0	
Stationery, .. .	2 0 0	28 0 0
Monthly Total Rs., .. .		696 0 0
or Annual Total Rs., ..		8352 0 0

2nd—Berseea.

Hindee.	*Bhopal Rs.*	
1 Head Teacher, ..	25 0 0	
1 Second Teacher, ..	18 0 0	
2 Monitors, @ 2, ..	4 0 0	
3 Maintenances @ 1,	3 0 0	
Stationery, .. .	2 0 0	52 0 0
Carried over, ..		52 0 0

	Bhopal Rs.	
Brought forward, ..		52 0 0
Oordoo.		
1 Teacher, ...	16 0 0	
1 Monitor, ...	2 0 0	
1 Maintenance, ..	1 0 0	
Stationery, ...	1 0 0	20 0 0
Monthly Total Rs., ..		72 0 0
Annual Total Rs., ..		864 0 0

APPENDIX II.

ANNUAL INCOME OF THE SEHORE SCHOOL IN 1849.

	Bhopal Rupees.
The British Government, Company's Rupees 600, --	660
The Begum of Bhopal, -- -- -- -- -- -- ----	2500
The Rajah of Rajgurh, -- -- -- -- -- -- -- --	600
The Rajah of Nursingurh, -- -- -- -- -- ----	800
The Nuwab of Koorwaee and his brother, -- -- --	400
The Rajah of Kilcheepoor, -- -- -- -- -- ----	400
The Bhopal Contingent Fund, -- -- -- -- -- --	3000
Total Bhopal Rupees, ----	8360
Add, Individual Subscriptions as below, --	438
Total Bhopal Rupees, ----	8798

besides occasional contributions and balances of customary donations on examination days.

NOTE.—*Individual Contributions in* 1849.

	Bhopal Rupees.
Ghasee Ram, Seth of Oojein, -- -- -- -- -- -- --	48
Moolchund, Seth of Bhilsa, -- -- -- -- -- ----	50
Meg Rai, Seth of Bhilsa, -- -- -- -- -- -- --	25
Sowdaghur Mull and Thân Singh, Seths of Sehore, --	50
Mr. Pierce, Head Writer, Political Agency, -- ----	25
The Political Agent, -- -- -- -- -- -- -- --	240
Total Bhopal Rupees, ----	438

MEMORANDUM.—*The only fixed income of the Berseea Branch School is the Government contribution of* 22 *Bhopal Rupees a month, or Rs.* 264 *per annum. The balance of expenditure was made good by personal subscription, &c.*

APPENDIX III.

Return of Boys in the School at Sehore, and in the Branch School at Berseea, in 1849.

	Department of the School.						
	Arabic.	Persian.	Oordoo.	Sanscrit.	Hindee.	Punjabee.	Total.
1st—the Sehore School.							
Hindoos 291 in all, viz.							
Brahmins, ...	0	7	11	41	71	0	130
Rajpoots, ...	0	0	3	1	23	0	27
Veisyas, ...	0	1	1	0	30	0	32
Kayets, ...	0	15	9	0	7	0	3
Mahrattas, ...	0	0	1	0	5	0	61
Other races or castes, ...	0	3	3	0	58	0	64
Mahometans 177 in all, viz.							
Sheeas, ...	0	1	2	0	0	0	3
Soonees, ...	6	38	123	0	7	0	174
Jaims, ...	0	1	0	0	24	0	25
Sikhs, ...	0	0	1	0	4	44	49
Total, ..	6	66	154	42	229	44	541
2nd—the Branch at Berseea.							
Hindoos 108 in all, viz:							
Brahmins, ...	0	0	0	0	28	0	28
Rajpoots, ...	0	0	0	0	11	0	11
Veisyas, ...	0	0	0	0	14	0	14
Kayets, ...	0	0	20	0	4	0	24
Mahrattas, ...	0	0	0	0	2	0	2
Other races or castes, ...	0	0	0	0	22	0	22
Mahometans 27 in all, viz.							
Sheeas, ...	0	0	0	0	0	0	0
Soonees, ...	0	0	16	0	11	0	27
Jaims, ...	0	0	0	0	13	0	13
Total, ...	0	0	36	0	105	0	141
Total of both Schools, ...	6	66	190	42	334	44	682

Note.—Of the 541 boys and young men attending the Principal School at Sehore, 161 are the sons of Soldiers or of followers of the Bhopal Contingent, the remainder 380 are wholly unconnected with the Force.

APPENDIX IV.

Scheme of Studies laid down for the Arabic Department of the Sehore School in the year 1849.

Six Classes in all.

First or Highest Class.

Subjects.	*Books.*
Tufseer, (Interpretation of the Koran), -- -- -- -- --	Berzavee.
Fiquh, -- -- / Oosool Fiquh, } Religion and Law,	Shurra, Vikaia, Hidaya. Towzeh Tulveeh.
Tuwarikh, (History), -- --	Jameh-ool-Tuwarikh Rusheedee.
Ilm-i-hikmut, (Philosophy), --	Sudra, Shums, Bazgah.
Nuzm, (Poetry), -- -- --	Subba Moallika.

Translation into Arabic.

Second Class.

Hyut, (Astronomy), -- --	Tusheeh-ool-Iflak, Shurra Chughmeenee.
Bulaghut, / Budeeh, } Rhetoric, Elocution,	Mookhtisur Maanee. Mukamat Hureeree.
Nuzm, (Poetry), -- -- --	Dewan Mootnubbee.
Ukhlak, (Morals), -- --	Ukhlâk-i-Nasiree.
Hikmut, (Philosophy), -- --	Meibudee.
Fiquh, (Religion, Law), -- --	Shureh Vuqaya.

Translation into Arabic.

Third Class.

Muntiq, (Logic), -- --	Shurra Soollum, (Humdoolla).
Oosool, (Roots, causes, effects), --	Noor-ool Unwar.
Hindsa, (Geometry), -- --	Euclid.
Tuwarikh, (History), -- --	Aboolfida, Tuwarikh Tymooree.

Construing Arabic into Oordoo and Persian.

Fourth Class.

Muntiq, (Logic) Elements, --	Kotbee, Shurra Tuhzeeb, Eesagojee.
Nuhv, (Syntax), -- -- --	Shurramoolla.
Furaiz, (Inheritance), -- --	Furaiz Shureefee.
Hisab, (Arithmetic), -- --	Khoolasut-ool-Hisab.

Construing Arabic into Oordoo and Persian.

Fifth Class.

Subjects.	*Books.*
Budeeh, (Reading, Elocution), --	Alif Leila, Mukamat Hureeree.
Nuhv, (Syntax, &c.), -- --	Hidayut-oon-Nuho Kafeea.
Surf, (Orthography, Etymology,)	Murha-ool-Urwah.

Sixth Class.

Surf, (Orthography, Etymology,)	Meezan Moonshaib Surf Meer, Fusool Akberee.
Nuhv, (Syntax, &e.),-- -- --	Nuhv Meer, Shurra Meiat Amil.

Note.—In 1849, no young men had reached any of the three higher classes, although two students would soon be qualified for the third itself. Some of the scarcer books, proposed for the upper forms, had not indeed been obtained, as for instance, the Jameh-ool-Tuwarikh Rusheedee, but others could be substituted until standard works were procured.

APPENDIX V.

SCHEME OF STUDIES LAID DOWN FOR THE SANSCRIT DEPARTMENT OF THE SEHORE SCHOOL IN 1849.

(Two main divisions of Study, viz,)

Sidhant, or Mathematics and the exact Sciences, Beeakurrun, literally Grammar, but including Literature and Metaphysics.

Six Classes in all.

FIRST OR HIGHEST CLASS.

SIDHANT.

Subjects.		*Books.*
Astronomy.	The highest result of	Sar Bowhm, Soorya Sidhant with the Commentaries, Sowr Bash and Kirnaolee.

BEEAKURRUN.

Theosophy and Cosmogony.	Mimans, -- --	Jeimunee 1st, or Poorb Memans, viz. with Sungreh.
	Vedant, -- --	Vyasa 2nd, or Ootur Mimans, viz. Vidant Sar, Punch Dushee.
Ontology and Cosmogony.	Turk Nyaya, --	Gowtum, viz. Turk Bashya, Turk Sungreh.
	Turk Veisheshik, -	Kunad, viz. Mooktavulee.
	Sankhya, -- --	Kuppil, viz. Sankh Kownodee.
	Yog, -- --	Puttunjul, viz. Puttunjul Bashya.

SECOND CLASS.

SIDHANT.

Astronomy, combination of leading Principles, -- -- --	Sunhita Varahee Mehcer.

BEEAKURRUN.

Vidya Sungreh, (Abstract of the Metaphysical and other Sciences with the exception of the exact or Mathematical,) -- --	Kilundee-ka-Prkâsh (a manuscript abstract.)
Neetee Shastr, (Polity,) -- --	Hitop'desh Kamund'kee.
Dhurrum Shastr, (Law and Custom), -- -- -- --	Munnoo, Metakshara.

THIRD CLASS.

SIDHANT.

Astronomy, Lineal, Numerical and Instrumental, -- -- -- --	Sidhant Shromunee (Goladhia Gunitadhia), Yento Raj Yentr Raj Chintamunee.

Subjects.	*Books.*
Geometry, -- -- -- -- --	Rekha Gunith (the Euclid of Raja Jey Singh.)
Algebra, -- -- -- -- --	Beejankoor, the Teeka of Beej Gunit.

BEEAKURRUN.

Pooran, (Mythology History), --	Bhagavut, Bhugvut Geeta.
Sahit, (Rhetoric, &c.,) -- --	Wagbutalunkar, Raveea Prukâsh Kooleeanund.
Chund, (Prosody, &c.,) -- --	Chund Prukâsh.

FOURTH CLASS.

SIDHANT.

Kurrun, (Astronomy), -- --	Gruhlaghuv, Bashwuttee, Teetee Chutamunee.
Pudarth Vidya Sar, (Natural Philosophy), -- -- -- -- --	Pudarth Vidya Sar, (translated from Yates.)
Geometry, -- -- -- -- --	Rekha Gunit, (Euclid by Rajah Jey Singh.)
Algebra, -- -- -- -- --	Beej Gunit.

BEEAKURRUN.

Kubit or Raveea, (Poetry), --	Magh-Naished.
Grammar, . -- -- --	Ummer Kosh-ka-urth, Sidhant Koumodee.

FIFTH CLASS.

SIDHANT.

Geometry and Arithmetic, --	Leelawuttee.

Geographical and Astronomical Maps.

BEEAKURRUN.

Grammar, &c., -- -- --	Lughoo Kowmudee.

SIXTH CLASS.

BEEAKURRUN.

Grammar, Reading &c., -- --	The 4 Roopavulee, Shubd Dhat Sumas and Kridunth, Umur Kosh, Rughovunsh one part.

NOTE.—In 1849, no student had entered the highest Class, and a few only had reached the second. Many of the Sanscrit books are in manuscript, and one, the Kulindee-ka-Prukâsh, is a compilation by the Head Master.

APPENDIX VI.

Statement of Subjects taught and of Books used in the Persian and Oordoo Departments of the Sehore School in 1849.

The *Persian* section comprizes the two higher classes of the Department, the *Oordoo* section the four lower classes; and the rule is, that boys shall learn Oordoo before they begin Persian. The principle further is, that modern knowledge shall be taught through the medium of these spoken or familiar tongues, and thus the elementary books on History, Geography, Astronomy, &c., are either translations of English Abstracts or are otherwise of admitted authority. The subjects taught in each of the six classes, further correspond as near as may be with those laid down for the six classes of the Hindee Department.

First or Highest Class, (Persian).

Subjects.	*Books.*
Persian Reading including Translation and Grammar, -- --	Unwâr Soheilee, Sekunder-nameh, Shah-nameh, Mukhzoon-ool-Fuvaid.
History, (General), -- --	Ferishta. Khoolasut-ool-Tuwarikh.
Law, (Inheritance), -- --	Rissala Serajee, (Fuwaiz).
Algebra, -- -- -- --	Jubr Mokabila.
Trigonometry, -- -- --	Ilm-i-Moosullus.
Astronomy, -- -- --	Mujmooa Shumsee, Mifta-ool-Iflak.
Natural Philosophy, -- --	No suitable books obtained.

Composition, Themes, &c.

Second Class, (Persian).

Persian Reading, &c., -- --	Kureema, Dustoor-ool-Muktoobat, Golistan, Bostan, Insha (Madhoo Ram).
Persian Grammar, -- --	Kuwaid Farsee.
History of England, -- --	Tuwarikh Englistan.
Geography, -- -- --	Khoolasut-ool-Jeeografeea.
Natural History, -- -- --	No suitable book obtained.
Geometry, -- -- --	Euclid.

Third Class, (Oordoo).

Versified Rythmical Narrative, --	Intikhab Dewân.
Grammar, (complete), -- --	Kuwaid Oordoo, (Ahmed Alee.)

Subjects.	*Books.*
Arithmetic, Fractions, Decimals, and ordinary accounts, --	Oosool Ilm-i-Hisab. Ditto, Surafee, &c.
History of India, -- --	Tuwarikh Hindoostan.
Geography, -- -- --	Khoolasut-ool-Joografeea.

Writing (ordinary) and Correcting bad Grammar.

FOURTH CLASS, (OORDOO),

Ordinary Narrative, -- --	Bagh-o-Behar, Taleemnameh II.
Grammar, (Elements of) --	Kuwaid Oordoo, (Ahmed Alee).
Arithmetic, (Rule of Three, &c.,)	Oosool Ilm-i-Hisab.

Writing Sentences from Dictation, &c.

FIFTH CLASS, (OORDOO).

Easy Stories, -- -- --	Hikayat Oordoo, Moofeed-oos-Sibeean.
Arithmetic, (Division), -- --	Oosool, Ilm-i-Hisab.

Writing Words and Syllables.

SIXTH CLASS, (OORDOO).

Letters, Figures, Short Sentences and Easy Stories, -- --	Huroof Tahujee, Durpun.

Writing Letters and Figures.

Arithmetic, (addition of units).

APPENDIX VII.

Statement of Subjects taught and of Books used in the Hindee Department of the Sehore School in 1849.

There are six classes in all, and the principle is that modern knowledge shall be taught through the medium of the spoken tongue, and hence the elementary books on History, Geography, Astronomy, &c., are either translations of English Abstracts, or are otherwise suitable for the object in view. As however, in Hindee books which aim at fullness or elegance, there is a considerable intermixture of Sanscrit words, some attention is paid to the Vocabulary and to the Rudiments of the Grammar of that language in the two upper classes. It will likewise be observed, that the subjects taught in each of the six classes correspond as near as may be with those laid down for the six classes of the Persian and Oordoo Departments.

First or Highest Class.

Subjects.	*Books.*
Sanscrit Grammar, -- --	Budreenath's Grammar.
Hindoo Mythology, Composition, &c., -- -- -- --	Ramayun, (Hindee version of).
History, (General), -- --	Kutha Sar and Marathee Bukhur.
Law, (Inheritance), -- --	Daya Bhaga including Metakshara.
Algebra, -- -- -- -- Trigonometry, -- -- -- --	Hutton's 2nd vol., (Marathee version of).
Astronomy, -- -- --	Khugol Bhoogol, Jotish Vidya.
Natural Philosophy, -- --	Sidh Pudarth.

Composition, Themes, &c.

Second Class.

Hindoo Mythology, Composition, &c., -- -- -- --	Muhabharut, Subha Bilas.
History of England, -- --	England-ki-Tuwarikh.
Geography, -- -- --	Bhoogol Durpun.
Natural History, -- -- --	Pudarth Vidya Sar.
Geometry, -- -- --	Hutton's 2nd vol., (Marathee. Leelawuttee,) Hindee.

The Sanscrit equivalents of Hindee Nouns, &c., taught verbally in the course of Reading.

Third Class.

Versified and Rythmical Narrative,	Brij Belas.
Grammar, (complete), -- --	Beeakurrun, (Adam's).

Subjects.	*Books.*
Arithmetic, (Fractions, Decimals), and ordinary accounts, --	Hutton's 1st vol., (Marathee). Leelawutee, (Hindee), Hisab Surafee, &c.
History of India, -- --	Hindoostan-ki-Kutha.
Geography, -- -- --	Bhoogol, (Pearce).

Writing (ordinary) and Correcting bad Grammar.

FOURTH CLASS.

Ordinary Narrative, -- --	Prem Sagur. Raj Neetee. England-ka-Beean.
Grammar, (Elements of), --	Beeakurrun, (Adam's).
Arithmetic, (Rule of Three, &c).	Gunitang.

Writing Sentences from Dictation, &c.

FIFTH CLASS.

Easy Stories, -- -- --	Oopdesh, Singhasun Butteesee.
Arithmetic, (Division), -- --	Gunitang.

Writing Words and Syllables.

SIXTH CLASS.

Letters, Figures, Short, -- --	Burnamala I.
Sentences and Easy Stories, --	Neet Kutha, I. and II.

Writing Letters and Figures.

Arithmetic, (Addition of Units).

APPENDIX VIII.

Statement of subjects taught and of Books used in the Punjabee Department of the Sehore School in 1849.

The object of this Department is simply to teach boys to read and write their mother tongue, and to cast small accounts. The three classes thus nearly correspond with the three lower classes of the Hindee and Oordoo Departments, and boys who wish to learn something of History, Geography, &c., may enter either of these sections: in Punjabee there are few books of any kind save such as contain popular songs and stories, or such as relate to the saints and apostles of the Sikh faith, and hence the selection now made may be somewhat modified as soon as opportunity offers.

First or Highest Class.

Subjects.	*Books.*
Ordinary Narrative, -- --	Chundee Churitr. Bhugvut Geeta. England-ka-Beean (translated).
Grammar (Elements of), - --	Pingul (Prosody) and Vernacula Rythm. Beeakurrun (adapted from the Hindee.)
Arithmetic, Rule of Three, &c.), --	Gunitang, (translated from the Hindee.)

Writing Sentences from Dictation.

Second Class.

Easy stories, -- -- --	Churnaka (Chanika). Bhugguton-ke-Banee.
Grammar, (first Principles of), --	Beeakurrun (adapted from the Hindee.)
Arithmetic (Division), -- --	Gunitang, (translated from the Hindee.)

Writing words and Syllables.

Third Class.

Letters, Figures Short sentences, and easy Fables, -- --	Vernacular I. Neet Kutha I. and II. (translated from the Hindee.)

Writing Letters and Figures.

Arithmetic, (Addition of Units).

APPENDIX IX.

Some of the Bye-Laws of the School at Sehore, 1849.

1st. Boys to be six (6) years of age before they can be entered in the Hindee or in the Persian and Oordoo Schools, and seven (7) years of age before they can be entered in the Sanscrit or Arabic Schools.

2nd. Boys cannot be entered to study Persian alone unless under special circumstances to be separately considered, but if having a sufficient knowledge of Persian they are allowed to enter, they will be included in one of the upper two classes, and they will at the same time read History, Mathematics, &c., either by themselves or with others their equals. Ordinarily, boys will enter one or other of the Oordoo classes according to their degree of knowledge, and work their way upwards, reading all that is taught in the school; similarly it is not allowable that a boy enter for the purpose of studying one or two subjects only excepting when good reasons may be assigned, and on consideration admitted to be valid.

3rd. When boys may have reached the 1st Oordoo or 3rd Hindee class, or classes higher than these, and have read for six months in the class last entered, they may, if so desired, and they appear capable to the Head Masters of such double labour pursue their studies in one other school also, that is, a third Hindee class scholar is at liberty to enter the Oordoo school or the Sanscrit or other school, but no boy is to belong to more than two schools at the same time. Boys belonging to two schools to attend each for the half of every day, or on alternate days as the masters of the two schools may determine.

4th. In the Sanscrit school, boys newly entered and who may have no acquaintance with that language or a very slight knowledge of it, are to study in both departments, Sidhant and Beeakurrun. But lads whose knowledge is equal to that laid down for the fourth Class, (from the top) may study one branch only, or both branches, as may be desired. Similarly boys after being promoted into the fourth class may confine themselves to one branch or continue to study both.

5th. In all the schools, promotion from one class to another to be determined mainly with reference to a knowledge of the language studied, to good writing, to facility in arithmetic, and to a knowledge of the elements of History and Geography. Thus, if a boy acquires a proper knowledge of the language, &c., but cannot keep up with other boys in Geometry or the Laws of Inheritance, &c., he may nevertheless be promoted after a longer or shorter period.

6th. Monitors and those holding scholarships are not to study in two schools at the same time, but in that school only from which they receive their allowances.

7th. Head Masters may give as much as two days leave in any one week, and also fifteen days during each six months to any one boy, including monitors and beneficiaries; but in the first instance four days should usually intervene between leaves, and in the second instance two months should usually intervene. The weeks to be considered to begin with Saturday, and the half years with January and July respectively. Applications for longer periods of leave to receive the sanction of the Political Agent.

8th. Beneficiaries or holders of scholarships on five (5) rupees in the Arabic and Sanscrit schools to be of one of the two highest classes existing at the time, and beneficiaries on four (4) rupees to be of the 2nd or 3rd Classes (2nd or 3rd from the top), for the time being, such scholarships to be held for an aggregate period of five (5) years only, whether wholly on five or wholly on four rupees, or partly at one rate and partly at the other.

9th. Receivers of maintenances in the Arabic and Sanscrit schools, to be of one of the upper four classes, or if of a lower class, to have studied for one year. These maintenances are to be held for a period of six (6) years only in the aggregate.

10th. Monitors in the Hindee and in the Persian schools, to belong to one of the two higher classes, and to be entitled to hold the position for a period of three years only, but they may remain in the school to read after that period, boys reading Oordoo only, that is, who have not entered the Persian classes cannot be appointed monitors.

11th. Receivers of maintenances in the Hindee and in the Persian and Oordoo schools to be of one of the upper four classes, or if of lower classes, to have studied one year. They are entitled to hold the maintenances for a period of six years in all.

12th. Boys cannot be both beneficiaries and receivers of maintenances, or both monitors and receivers of maintenances at the same time.

13th. Boys in any one of the upper five Arabic and Sanscrit classes, and boys in either of the two Persian or in either of the upper two Hindee classes, may receive prizes for the same subject at two successive examinations; but they are not to receive the same prize more than twice, nor are they even to receive the same prize twice by allowing an examination to intervene. In the 6th Arabic and Sanscrit classes, in all the Oordoo classes, and in the lower four Hindee classes, a prize can be obtained once only for the same subject in the

same class. Beneficiaries and monitors are on the same footing as other boys with respect to prizes.

14th. Boys who are habitually late in attendance, or who overstay their leave of absence without good reason, to be liable to lose any honorary rank or pecuniary benefit they may enjoy, or to be expelled or to be both reduced and expelled. The Head Masters can expel boys who do not hold such honorary rank as a monitorship, a scholarship, or a place in the Agency office, but the cases of those who hold rank are to be reported for the orders of the Political Agent.

15th. Boys to be admitted to the school on a written application given in by the parent or guardian of the boy usually in person on any Thursday morning, to the Political Agent if he is in Sehore, at the time, or if the Agent is not in Sehore, the written application to be delivered usually in person to the Head Master of the particular Department, who will forward it to the Agent with his opinion as to the boys elegibility, but who will in the meantime admit the boy if he is considered elegible. On withdrawing boys, the father or guardian if in Sehore will either make a written request, or explain in person, his reasons to the Agent. If not a resident of Sehore, he need make a written request only.

16th. Printed books, &c., will continue to be supplied gratis as at present, but all boys whose parents can afford it, should provide sand-boards and copy-books of their own.

17th. Books, &c., lost or destroyed through wantonness or carelessness, to be paid for at such prices as the Head Master of the Department may fix with reference to the wear and tear of the book or other article.

18th. During the annual vacation boys in the three upper classes of Hindee, in the two Persian, in the highest Oordoo, and in the five upper Classes of Arabic and Sanscrit, to be allowed to take book so their homes at the discretion of the Head Masters of each school.

19th. Masters may punish boys by beating them moderately with a slight switch on the hand or arm or leg, or back or shoulders, or by causing them to stand in a corner, or by not allowing them to go home for a meal, or in other ordinary ways which will only cause temporary pain or inconvenience. Beneficiaries and monitors may place boys in a corner, but they are not to give a regular beating to any boy, although they may check him by one stroke with a switch on the hand or back or shoulders, &c.

20th. After periods of five (5) years, masters may have six or eight months' leave, accordingly to distance, or in special cases a greater

number of months leave, viz., for three (3) months on full pay, for the additional three or five months on half pay, and for any term in excess of eight months without pay. This leave is not a right, but it will be given if no injury to the school is likely to arise. If leave is granted for any special purpose, and for more than one month during the five year intervals, no pay will be allowed. Under peculiar circumstances leave will be given during the intervals for a month or less without deductions.

21st. Beneficiaries and monitors may have one month's leave of absence, in addition to any holidays occurring at the time, without loss of rank or pay. If they overstay their leave, they will lose rank and pay, for the excess of time, but they may be re-appointed to their situations.

SPECIAL BYE-LAWS FOR THE PUNJABEE CLASSES.

1st. The monitor to be of the first or highest class.

2nd. The receivers of maintenances to be of the first or second class, or if of the third class to have been scholars for a year at least.

3rd. Boys of the first class, or boys who may have passed through it, and continue or become regular attendants in the Sikh school, maintained in the Contingent Lines for Religious instruction, may enter the Hindee, Oordoo, or other Department of the School, for half days, or for alternate days, if the master think they are capable of such double study.

NOTE.—The Bye-Laws are hung up on boards in each Department, as are likewise Tabular Statements of the distribution of hours for studying each subject, and Tabular lists of Holidays.

During the cold and rainy seasons, school is held morning and evening. During the hot season, once a day only, viz., in the forenoon or till about eleven o'clock.

The annual vacation of a month is preferentially given in April as at that season marriages usually take place, and applications for leave of absence are consequently numerous. The other holidays amount in the aggregate to nearly one hundred days per annum, so that less than two-thirds of a year are given to education.

The following books ar regularly kept in the school in the common language of each Department, as Persian, Hindee and Punjabee

1st. A general list of Boys admitted and discharged, shewing in some degree, the progress of each through the School.

2nd. A Monthly Statement of attendance, showing whether regularly present, or wholly or partially absent each day, with or without leave on sufficient reason.

3rd. A weekly Report of each class, showing the names of the boys standing first, or in some instances both first and second in every Department of study.

4th. A detailed Statement of Class-books, Instruments, &c., arranged according to language, and subject or according to kind, showing date of receipt and of loss or destruction by wear and tear, &c., showing also prices, and whether a book is printed or written, with place of publication, &c., &c.

5th. A monthly return of Class-books, Instruments, &c., and in store, with the number of boys, using or requiring to use each book or article. This list at once enables the agent to arrange about procuring new books, with reference to demand, means, season, &c., &c.

The accounts of receipt and expenditure are regularly prepared in English, Persian, and Hindee every month, and signed by the Agent.

APPENDIX X.

Proposed increased Establishment of the School at Sehore, submitted to the Supreme Government, 18th April 1849.

General.	*Bhopal Rs.*					
1 Jemadar, ..	7	0	0			
4 Hurkaras, @ 5 each, ...	20	0	0			
2 Furashes, @ 4 each, ...	8	0	0			
1 Bheesty, ...	5	0	0			
1 Sweeper, ..	3	0	0			
Allowances to a Bookbinder, ..	12	0	0			
Allowance to Native Doctor of Agency, ...	15	0	0			
Allowance for Oil for light, ..	2	0	0			
				72	0	0
Arabic, Persian, Oordoo.						
1 Head Master, Arabic chiefly,	100	0	0			
1 Second Master, Persian, ...	60	0	0			
1 Third Master, Oordoo, ...	40	0	0			
1 Fourth Master, Oordoo, ...	30	0	0			
1 Fifth Master, Oordoo, ...	25	0	0			
1 Sixth Master, Oordoo, ...	20	0	0			
1 Seventh Master, Oordoo, ...	15	0	0			
4 Scholarships Arabic, viz., 2 @ 5, and 2 at 4,	18	0	0			
4 Maintenances Arabic, @ 2, ..	8	0	0			
6 Monitors Persian, @ 3, ..	18	0	0			
12 Maintenances, viz., 6 Persian at 1½, and 6 Oordoo at 1, ..	15	0	0			
1 Curator of Books, ...	20	0	0			
1 Duftree, ...	8	0	0			
Stationery, ...	5	0	0			
				382	0	0
Carried over Rs., ..				454	0	0

	Bhopal Rs.					
Brought forward, ..				454	0	0
Sanscrit.						
1 Head Master,	80	0	0			
1 Second Ditto,	60	0	0			
6 Scholarships, viz., 3 @ 5 and 3 at 4 each, ..	27	0	0			
8 Maintenances @ 2 each, ...	16	0	0			
1 Curator of Books, ...	15	0	0			
1 Duftree, ...	7	0	0			
Stationery, ..	4	0	0			
				209	0	0
Hindee.						
1 Head Master,	80	0	0			
1 Second Master,	50	0	0			
1 Third Master,	40	0	0			
1 Fourth Master,	30	0	0			
1 Fifth Master, ..	25	0	0			
1 Sixth Master,	20	0	0			
1 Seventh Master,	15	0	0			
8 Monitors, at 3 each, ...	24	0	0			
16 Maintenances, viz., 8 at 1½ and 8 at 1, ..	20	0	0			
1 Curator of Books, ...	20	0	0			
1 Duftree, ...	8	0	0			
Stationery, ...	5	0	0			
				337	0	0
Punjabee.						
1 Master, ...	20	0	0			
1 Monitor, ..	3	0	0			
3 Maintenances, viz., 1 at 1½ and 2 at 1, ..	3	8	0			
Stationery, ...	2	0	0			
				28	8	0
Mahrattee.						
1 Master, ...	20	0	0			
1 Monitor, ..	3	0	0			
3 Maintenances, viz., 1 at 1½ and 2 at 1, ..	3	8	0			
Stationery, ..	2	0	0			
				28	8	0
Monthly Total, Rs.				1057	0	0
or Annual Total Rs.				12684	0	0

APPENDIX XI.

PROPOSED INCREASED SUBSCRIPTIONS TO THE SCHOOLS AT SEHORE, SUBMITTED TO THE SUPREME GOVERNMENT, APRIL 18TH 1849.

	Bhopal Rs.
The British Government, Co.'s Rs. 3000, -- --	3300
The Bhopal State, -- -- -- -- --	3000
The Rajgurh Chief, -- -- -- --	1000
The Nursingurh Chief, -- -- -- --	1000
The Koorwaee Chiefs, -- -- -- --	600
The Kilcheepoor Chief, -- -- -- --	600
The Rajah of Dhar for Berseea, -- -- --	600
The Bhopal Contingent Fund, as at present, --	3000
Total per annum Rupees, -- --	13100
Deduct Establishment, &c., -- --	12684
Leaves available for books, &c., Rs.,	416
NOTE.—Individual subscriptions in 1849, ...	438
Add, balance as above, ...	416
Available Surplus for books, &c., Rs.,	854

besides occasional contributions and balances of donations on Examination days.

SUPPLEMENT.

SOME REMARKS ON THE GENERAL QUESTION OF EDUCATION IN INDIA.

(Written with reference to a quotation in the Minute of Sir Erskine Perry, on Education in the Bombay Presidency, dated the 26th October 1849. The Minute was printed in the "Bombay Times," and the following letter was accordingly addressd to the Editor of that paper.)

SIR,—I have just read in your issue of the 28th November, the Minute of Sir Erskine Perry, on the state and prospects of Education in India. In this useful and well considered paper, he does me the honor to refer to my views on the subject, but as his summary of what I say, is partial, or incomplete, it is also incorrect, and both for this reason and on account of the great importance of education, I am induced to ask you for a column of your Journal.

Sir Erskine Perry refers to my opinions as if I thought that Sanscrit, Arabic, and Persian should be used to the *exclusion* of the vernacular dialects in diffusing modern knowledge among the Indians, advocate, indeed, the active employment of the classical languages for reasons which I briefly stated, *(History of the Sikhs Note, p.* 336,)

but I desire them to be used in *addition* to the provincial tongues, and I am equally ready to give English a place in any general scheme of instruction. It is, I think, an error to limit ourselves to any one medium, and it is this unwise restriction which has led to some prejudicial partizan writing, and perhaps to a misapprehension of the question at issue, on the part of the public.

In India there is no want of a desire to obtain knowledge. An acquaintance with reading, writing and arithmetic, is necessary to the business of life in a country almost as civilized perhaps, as Spain or Greece, and literary and scientific acquirements likewise give honour and distinction among Hindoos and Mahometans as well as Europeans. The kayets of Central India and the Gangetic Provinces, the khutrees of the Punjab, and the brahmins of Cashmeer, Bengal, and the Deccan, all regularly instruct their children in order that they may obtain a livelihood as copyists or as clerks in public and private establishments; or in the case of brahmins, as family priests and astrologers, as well as mere writers and petty officials. The bohras and bunneeas sedulously render their children quick accountants, and if need be, skilful book-keepers. The poorest Mahometans are desirous that their sons should once at least read the Koran, and although the language is not comprehended, the alphabet is equally the key of the much-used Persian; boys are often preferentially entered in English schools if there is a prospect of getting them employment as writers, for the pay in the English Department of offices is commonly better than in the vernacular sections. To give instruction in reading the Koran, or in the Persian languages, or in the ordinary vernacular dialects, or in the mercantile varieties of these tongues, there will thus be found one or more schools, not only in cities, but in every town and large village, in which the teachers receive fees of four annas or so a month, or in which they are occasionally paid in kind, as in grain or fuel or in service, as by supplying water or making and mending clothes. The estimation in which a learned moolla or pundit is held is notorious, the extent to which a Mahomedan gentleman is familiar with Arabian Law and Persian Poetry, is equally well known, a Hindoo of any acquirements is immediately greeted with the honorary title of "Shashtree," "Sidhantee," &c. and among the better classes of either creed the saying is common, that knowledge is the tughma of "shirafut" or indeed of "insaneeut," the symbol of gentility, or even of humanity. Would this have been a phrase in England in the beginning of the sixteenth century?

Thus the religious and the social state of the country is such that some familiarity with reading and writing will always be necessary to large numbers of the community, and that some acquaintance with Hindoo and Mahomedan law will always be sought by a considerable class, while here doubtless, as elsewhere, a few lovers of knowledge for its own sake will devote themselves to Poetry and History, to Mathematics and Philosophy. This is the condition of India with respect

to the two great subdivisions of its inhabitants, but a third race is now dominant, and we must therefore inquire how far English is necessary to any but ourselves. Now we cannot colonize the country so at least to retain our nationality at the end of even two generations, and we consequently form a very small part of the general population. We do not perhaps, common soldiers and all, number above fifty thousand out of two hundred millions, and we keep wholly aloof from our subjects in all domestic relations, or in all that binds man to man. In matters of business, we use English only among ourselves; the Governor General corresponds with dependant Princes in Persian, and European administrative officers of all kinds, use that language or one of the vernacular dialects in tendering counsel, in maintaining discipline, in dispensing justice, and in assessing taxes, hence a *few* Indians only need necessarily learn English at all, and *they* only so much as will enable them to copy letters and keep books of accounts. In Calcutta, Madras, and Bombay, where Englishmen are not only dominant, but pursue many avocations, our language is doubtless more or less known to the upper ranks of Hindoos and Mahometans, for our points of contact are increased, and where conquerors are numerous, they must give a tinge to manners; but these are exceptions, and what are such exceptions to the whole area of India and the whole mass of the Indian people.

For mere purposes of business, there will always exist schools of instruction in Hindee and Urdoo, in Persian and English, but the ordinary municipal affairs of life are conducted irrespective of poetical beauties and recondite truths of science, and official business, moreover, is a cold thing which begets no friendly intimacy, and requires no confidence save that of reason or of fear. A knowledge of our language is not, therefore, even a pleasing convenience which might gradually lead to an interest being taken in our literature. An Indian uses his common mother tongue for every thing connected with his duties as a parent and as a subject, and he defers to Arabic and Sanscrit, the classic repositories of his creed as containing all that is bound up with his hopes and his fears, his convictions and his superstitions. Of English, five in a hundred thousand may know enough to cast an account and copy a letter, and five in a million may be able to converse in it with fluency; but up to the present time, perhaps *one* man only, viz., Rammohun Roy, has attained to a scholarly knowledge, even of one branch of English literature. English, moreover, excites no sympathies, and appeals to no feelings; it relates solely to war and tax-gathering, and it possesses no associations which delight the sense or overawe the imagination. We are indeed so different in manners, and so superior in civilization that we are rather wondered at than admired, rather feared than loved. We choose to render a knowledge of our language politically needless, social antipathies prevent it becoming a choice, and yet we desire that our morality shall everywhere prevail, and that our science shall supersede all other systems.

Our desire is proper, but how have we attempted to achieve the great task? By ourselves studying Arabic and Sanscrit, rather with reference to subjects of European inquiry than to objects of Indian amelioration; by giving young men a superficial acquaintance with the *writings* of a few of our great authors rather than a full and clear insight into our *principles* of criticism and speculation; and by a series of puerile tales and meagre historical epitomes, and of imperfect or inaccurate scientific summaries in the several provincial dialects, which are moreover usually written with little of idiom and less of perspicuity and elegance. To this, as to every thing else, there are exceptions, and perhaps the Bombay publications are on the whole better than others. For reading these text-books, we have here and there established schools, which are frequented some by hundreds and the rest by tens rather than by thousands, and rather because the thing is novel and the instruction gratis or cheap in the extreme, than because error can be got rid of and truth found. Our method is thus weak and inefficient, and it is rendered ungracious and even repulsive to the priests as well as to the laity, by our systematic depreciation of Arabic and Sanscrit lore, and by our contemptuous disregard of all that our subjects look upon with respect as customary, if not with implicit faith as rationally certain. We foolishly place ourselves in a state of antagonism not only to the many we wish to instruct, but to the few who can best help us to diffuse knowledge, viz., to the regular followers of learning, who completely sway the minds of their countrymen, and who may themselves have many prejudices to overcome, but who are yet accessible to the truth, if it be conveyed in a modest manner, and with logical or mathematical precision. The numerous vernacular schools improved, extended or set on foot anew in the North Western Provinces, scarcely come under this description. They give only such instruction as concerns the commonest affairs of business, and have no immediate bearing upon the acquisition of modern knowledge, but they are necessary to any Government, Hindoo, Mahomedan or Christian, and it is well they are being organized: neither is it intended to object to such special institutions as Medical Colleges and Engineering schools. They are excellent in their way, and will produce useful practical men, but admission into them is sought for the sake of the livelihood it insures, and after all, the knowledge obtained in them is necessarily slight, if not wholly empirical. No one who leaves them is likely to revolutionize science, by the example of his life or acquirements, for his time is taken up in gaining his bread, and he does not understand the general bearing of what he daily practises in detail.

As an instance of the want of tact in the composition of elementary works, Mr. Marshman's History of India may be mentioned, and yet Mr. Marshman is a man whose sobriety of thought, knowledge of Indian legislation, and familiarity with the native turn of mind, give a special value to his periodical writings. The impression which

this History leaves is, that the chronology and mythology of the Hindoos are treated in a slighting and even taunting way, instead of being either carefully abstracted without depreciatory comment, as we formerly did with the Trojan and Cymric legends of our own annals, or wholly omitted after the manner of our present epitomes. All our writers moreover forget that the learned of India make as much distinction as ourselves between popular belief and demonstrative science. As Coll. Kennedy and Sir William Jones long ago observed, *(Res. Hind. Mythol., p.* 149, and *As. Res. II.* 190*)* the brahmins do not confound the cosmogony of poets and rhapsodists with mathematical astronomy, and a little inquiry will show that they equally separate theology from metaphysics. Thus under the term "Mimans," they include the two systems of creation based on the revealed writings, and under the term "Turk," they include the four systems based primarily on the human reason. In this way, a brahmin will dispute about life and the soul as independent of the literal meaning of the Veds as "Alghazali" would have argued independent of the Koran, or, as we now do of the Law and of the Gospel, yet we wholly disregard this scientific phase of the Indian mind, and seize hold of its popular or ignorant aspect for the petty purpose of depreciation, while thus contemning the knowledge of our subjects, we have done so little to convince them of the reality of our own superiority, that very few Indians believe we have any high or pure science at all. They have every day proof indeed of our pushing worldliness of charecter and of our mechanical dexterity, but there is no living impression abroad of our excellence as moralists, as critics or as logicians; and hence no one seeks to become acquainted with our literature. The great mass of Indians indeed see few Europeans save Government officials, and perhaps modern Collectors and Captains are not better adapted than the publicans and centurions of old to convince the multitude of the mental powers of their new rulers. Even the very classes of men who might be expected to possess high qualifications, viz., our ministers and missionaries, greatly disappoint the Indians. The chaplains are usually destitute of all knowledge, both of the Indian languages and literature, and the missionaries seldom possess more than a facility in one or two of the vernacular dialects. The example of their lives is thus of greater value to our national repute than the extent of their undoubted acquirements in Greek literature and Biblical interpretation, and our best preachers are looked upon in the light of mere "Gosayens" and Owleeas, or as holy but ignorant devotees. There were and still are some noble exceptions to this estimate, men of whom England may be proud, but I talk of the vast extent of India and not of such little areas as Calcutta and Bombay. I may add, that beyond the Presidencies our medical functionaries have done almost as little as our clergy, to redeem our character in India, although out of it they have added to the high name of the English faculty. As physicians, the Mahomedans have a higher or a more useful reputation than ourselves, and even Hindoo chiefs and mer-

chants will rather call in a "hukeem" than seek the aid of a "Doctor." This arises in part indeed from the circumstance that our Surgeons do not choose to lay themselves out for miscellaneous practice, but the effect is the same, our science remains unappreciated. Neither our Doctors, our Chaplains, nor our Missionaries are particularly to blame for this, they, like other servants, whether of Government or private associations, must usually be content with the performance of their prescribed duties.

We are wrong if we suppose that Hindoos or Mahomedans have any insurmountable objections to receive scientific truths, merely because they may be advocated by foreigners. The whole history of either people contradicts this. We all know the avidity with which the Arabs made Galen, Ptolemy and Aristotle their own, and even the remoter Indians have a Romuk Sidhant, an astronomy of Greece or Rome. They further regard Jaee Singh's Euclid as a text Book, and if I remember rightly, Arya Bhut some thirteen or fourteen hundred years ago, went the length of distinctly admitting that the "kosmas" of the intellect could not be reconciled with that of the Veds. Similarly we have only to keep our peculiar religious creed distinct from our mental inductions, we should appeal to reason and observation alone, and we should meet pundits and moollas on the ground of our common humanity without reference to doctrinal agreements and discrepancies. When all are thus engaged in a general pursuit of abstract and phenomenal knowledge, the morality and theology of the teachers will doubtless have an influence on the pupils. But in a country like India, possessed of a polished literature, a revered law and an organized priesthood, we can more readily gain the reason than conscience of our subjects, and if we *begin* by assailing their feelings we shall never make any progress with their understandings.

Mr. Hodgson had discussed at length the method to be pursued in diffusing knowledge by means of the vernacular tongues, and the English community generally is in favour of making its own language the vehicle of at least the higher branches of science. But as I have shown, the people of India neither learn, nor have occasion to learn English for the ordinary purposes of life, and it is idle to think that any save a choice few will at present undertake its acquisition for the sake of its literature. The provincial dialects can and should be made use of, but they are indeterminate, and also poor in the extreme, except for ordinary colloquial purposes, and they must, therefore, be largely intermixed with the Arabic and Sanscrit terms, and perhaps in some sciences with English definitions. Even then they will be thought unseemly or unsuitable vehicles by the learned classes, and by insisting on their exclusive use we shall further incur the odium and the disadvantage of seeming to set ourselves in opposition to the most influential men in the country. We may condemn the prejudices of the oolma and the pundits, but we must

deal with people as we find them; their nature is not easily changed, and even in the petty matter of speech we should remember that in our own land we should not lecture upon the steam engine in Cornish or Lowland Scotch, although addressing a Penzance or a Paisley audience, or if we did, our exposition would have to be crowded with English and Aglicised terms of mathematics and physics, which would be quite unintelligible to ploughmen and journeymen. Knowledge has a language as well as ignorance, and the key is worth gaining for the sake of the treasures it unfolds.

In aid of the vernacular and English vehicles, we should therefore call in Sanscrit, Arabic, and Persian, so that what we inculcate may not only have logical force, but lingual grace, and so that we may enlist in support of our political influence, the social predilections of those whom we wish to persuade. Neither should we neglect the sciences as we find them expounded by the Arabs and Hindoos, but rather take up and continue these ancient methods, where they fail from weakness or error. Thus Dr. Ballantyne of Benares, most judiciously proposes to graft our philosophy of mind on the "Nyaya" of Gowtum, an instrument as conclusive, and perhaps more copious than the logic of Aristotle. Similarly we should not disdain the meagre Algebra or the unsystematic Geometry of our predecessors, nor should we neglect their often happy physical illustrations of abstract ideas, our object should indeed be to adopt, as much as we can, so as to show that truth is the same, whether in the east or the west, and in explaining the defect of old modes and notions, we should at the same time freely admit that many modern instruments are yet imperfect, and that our knowledge is wholly phenominal and partly empirical. We cannot in truth, and we should not in appearance, assume our science to be perfect, and we should therefore confess ourselves to be like others before us merely humble explorers of the ways of nature.

In order that our knowledge may be introduced under every advantage, works of history and criticism and treatises on every science, mathematical, physical, and mental, should be prepared at once perspicuous and full, in English, in Sanscrit, Arabic, and Persian, and in Oordoo, and other dialects of the country. These books should be the exact counterparts of one another, but they ought not to be mere abstracts. They should be scientific in their form, elegant in their language, and profuse in their illustrations, whether by simile or by diagram. Armed with volumes of this kind, on which every thing is not only demonstrated to the reason, but rendered evident to the sense and agreeable to the taste, we may be sure, that we shall not be long in impressing our knowledge upon the people of India. Curiosity will be awakened by the novelty of the vernacular renderings; conviction will follow the use of the accustomed Sanscrit and Arabic Instruments, and completeness will attend a recourse to the varied riches of English Literature. Each will help the other, but although forming a kind of series, they should be simultaneously introduced and taught.

I have reason to believe, that the views of Dr. Ballantyne of Benares, are similar to those I have now stated at length, but which I have for some time entertained, and which are briefly given in the "note" quoted by Sir Erskine Perry. Dr. Ballantyne's reputation as a scholar and experience as a teacher, give great weight to the proposed scheme, if it is not, indeed, that of every sensible man in the country. The production, it is true of the kind of books wanted is not easy, and the further machinery of Colleges and Schools would involve a great outlay; but, to be the Masters of India, and to confess that we cannot convince the people of our wisdom, is only one degree less discreditable than the admission that we cannot make it pay the expenses of its Government. We scarcely realize above half the revenues of Aurungzeb, yet obedience was less perfect, and the military art less formidable, in the seventeenth than in the nineteenth century. The fancy and imagination, the sagacity and the learning, of Shakespeare and Milton, of Bacon and Newton, of Hume and Gibbon, now rivet the attention of civilized Europe; and where their countrymen reign undisputed, are even the names of these teachers of thought to remain unknown, save to a few young men of some capital cities? we have not only to cover India, with material monuments of our skill and greatness, but to make it our boast, that as the Mahomedans gave a shock to the system of social caste and religious idolatry, so have we everywhere diffused precise knowledge and rational law. To do this is our function, and it is time that we set about it systematically, and with the determination to succeed.

(Signed) J. D. CUNNINGHAM.

LOODIANAH:
December 20*th*, 1849.

(See *Bombay Times*, January 2nd, 1850).

GENERAL REPORT

ON

PUBLIC INSTRUCTION

IN THE

NORTH WESTERN PROVINCES

OF THE

BENGAL PRESIDENCY,

For 1851-52.

AGRA:

PRINTED AT THE SECUNDRA ORPHAN PRESS.

1853.

REPORT.

GENERAL REMARKS AND OBSERVATIONS.

THE proceedings of the past year have been chiefly distinguished by the establishment of a Government School at Ajmere. Encouraging accounts had reached the Government of the disposition of the people there, to avail themselves of the occasional means of Education provided from private sources; and the Lieutenant Governor was assured, that Ajmere and the surrounding country offered a wide and an inviting field for education, and one which, being entirely unoccupied, had strong claims upon the Government.

Although the School was not fully organized till the middle of the year, and several difficulties were experienced at the outset, yet by the assiduous and able superintendence of Dr. Buch, it was soon in full operation, and the examinations held at the close of the year, proved that considerable progress had already been made in the different branches of the Institution.

An agency has likewise been organized for encouraging the village Schools throughout Ajmere and Mhairwara.

The Lieutenant Governor looks with hope towards this new sphere of action, and anticipates the happiest results from the provision of education thus made, not only for the British subjects of Ajmere but for the inhabitants of the adjacent States.

The other Institutions present no very prominent subjects for remark.

The Agra College.

The attendance in the Agra College has somewhat decreased; the numbers being 376 in the present year, against 407 in the preceding. This is attributed to the establishment of other schools, and of a collegiate institution by the Church Mission Society.

The diminution of students, which is the result of such causes, cannot be regretted. For besides that the means of education afforded to the people are thus increased, the prevalence of efficient schools will tend to place the Government College on a proper and more satisfactory footing. The task of teaching boys of a young age, which now occupies much of the time and attention of the College Masters, may well be devolved upon these schools, and the operations of the College, commencing with pupils who have already received elementary instruction, will be concentrated with greater effect upon the more advanced students.

Among these private seminaries, that of Kishen Lall, a former student of the Agra College, attended by 50 or 60 boys, is deserving of special notice.

The drain upon the College by the removal of students in consequence of obtaining office or employment, continues to exhaust the higher classes, and to produce an apparently less favourable result in the examinations. The senior class was thus reduced from 17 to 11 during the year, and there were none left qualified to hold a senior scholarship.

Upon the whole, the condition of this College is satisfactory. English literature and science continue to be prosecuted with success; although it might be wished that vernacular and Anglo-vernacular studies were prosecuted with more assiduity and a better result.

The Delhie College.

It is no longer a subject of complaint * that the pupils of the Delhie College find difficulty in procuring employment. A list of no less than 33 students will be observed in the report, who obtained situations during the past year, and that list is believed to be incomplete,

The demand for admission is steadily on the increase. The average of new pupils during the three previous years was 93: that for the year under report, 151. The proportion of paying students has so greatly advanced, that the receipts in the present year are Rs. 777 in excess of the preceding.

The remarks by Mr. Cargill on the necessity of a general and a sound elementary instruction are important, and correspond with those of Lieutenant MacLagan, which will be noticed in their place. There is undoubtedly a danger of attending exclusively to single and isolated studies, and of neglecting that general cultivation which is best fitted to arouse and to improve the intellectual faculties of the native students.

* *Vide* Report for 1849-50, page 2.

To an universal classification, such as is contemplated by Mr. Cargill, and in which the same persons shall invariably compose the same classes in all departments, there appears to be at present considerable difficulties, from the various degrees of proficiency in the different departments, Oriental and English.

Several of the Masters have been, and are still engaged on the preparation of educational works in the vernacular; the names of Ram Chunder, Radhakishen, Hoosainee, and Kurreembuksh deserve honourable mention in this respect.

Upon the whole, the combined attention paid to Oriental and English study, and to the acquirement of science through the vernacular language of the country, continues to be a characteristic and praiseworthy feature of the Delhie College.

Some efforts are also being made in the vicinity of Delhie for the encouragement of the village schools: a pergunnah visitor having been employed there on a salary of Rs. 50 per mensem.

The Benares College.

It will be seen from the copious extracts made from the Benares Committee's report, that Dr. Ballantyne and his staff continue to prosecute, with unabated vigour, their efforts to impart knowledge and enlightenment to the learned classes of the Hindoos. The proposal of the Principal for strengthening and improving the Nyaya Philosophy chair, have been approved and sanctioned by the Government.

His remarks upon the proposed course of English metaphysics and chemistry, and the benefits anticipated in consequence, will be perused with interest.

The Government have noticed with approbation the efforts of Bapu Deva in the composition of scientific works, in the Sanscrit and Hindee languages. Similar services are expected from Venkat Ram Sastri. Valuable additions may thus be anticipated to the literary and educational works in the vernacular, of which so great a want is at present experienced.

The Committee still complain of difficulty in finding employment for their educated students. But the Government, on the principles already explained on more than one occasion, cannot interfere by any direct assistance to remove this difficulty.

The Bareilly College.

In the report of the Committee at Bareilly will be found the measures adopted for carrying out the collegiate character, which, as announced in the last report, has been conferred on this Institution. The attend-

ance appears to have been good and regular, and the progress reported, encouraging.

The project of the Committee for keeping the boys upon the premises of the College during the whole day, and for lodging those who come from a distance, is important and deserves consideration.

The Committee have adduced reasons against the adoption of the Bengal scheme (noticed in the last report*), for introducing a common course of study, and one set of examination papers throughout the whole of the Colleges of India. Attention however is still directed to the accomplishment of this object, and it is hoped that it may hereafter be carried into effect to a greater or less degree.

The Saugor School.

The paying system, introduced into the Saugor school during the year, slightly affected the attendance, which nevertheless continues to be good.

The progress of the Oriental, is more satisfactory than that of the English classes, and the reason seems to be that there are fewer inducements to the study of English in the Nerbudda Territories, than in the North Western Provinces.

The Roorkee College.

The College of Roorkee, continued during the whole of 1851, under the superintendence of Lieutenant Maclagan. His place has since been well supplied by Captain Oldfield. On his departure for England, the Government took occasion to compliment Lieutenant Maclagan in warm terms, on the successful result of his able and devoted labours, as apparent in the prosperous condition to which the Roorkee College had risen in his hands.

Lieutenant Maclagan presents in his report an interesting account of the progress of the Institution.

The 2nd Department has been considerably increased, so as to keep pace, in some measure, with the requirements of the public service.

The observations made by the Principal on the necessity of providing the native pupils with a previous thorough acquaintance with the lower and more elementary branches of knowledge, are of deep importance, and should counteract the tendency observable in some quarters, of prosecuting with exclusive diligence certain branches of science and literature, while the ground-work is left deficient. The fact that those who have entered the Engineering College with lower Mathematical attainments, have turned out more practically useful and valuable men, in general, than the distinguished mathematicians,

* Report for 1850-51, page 3.

is symptomatic of some deficiency in the training of the latter, and should be carefully weighed by the conductors of the several Colleges.

An analogous remark is applied by Lieutenant Maclagan to such as have devoted their main attention to English. Those who have acquired knowledge through their vernacular language, are stated to be more ready in improving what they have learnt.

The Press has been established at Roorkee, and is now constantly employed for printing and lithographing educational and scientific treatises. A list of these is given in the Report, including a series of elementary professional works in English and in Urdu.

Lieutenant Maclagan has made some valuable observations on the requirements and the difficulties of Urdu translations. It will however be difficult, in the present state of oriental study, to prepare a technical vocabulary in Urdu, as contemplated by him. The necessities of each translation or original work, will best suggest the appropriate rendering, and thus it may be expected that a vocabulary of scientific terms will eventually grow up, better adapted perhaps for the purpose, than any list however carefully prepared at present.

The numerous applications for admission are a gratifying proof that the benefits of the Institution are beginning to be appreciated by the native community. And the detail of 72 appointments, generally of an important nature, held by ex-students of the Roorkee College, is the best proof that it has already commenced to answer the objects proposed on its foundation.

An organized agency has been established in connection with the College for promoting indigenous education, in a circle of country around Roorkee, and it is a new feature of the institution that the lower department of the College begins to be replenished by scholars from these village schools.

The scheme noticed in the last report* for the enlargement of the Roorkee College, and rendering it more adequate to supply the demands for engineering skill made by the Government, as well as by private enterprise, has received the sanction of the Honourable the Court of Directors. But as that sanction was given after the close of the year under report, the notice of this scheme, and of the alterations consequent thereon, will fall with propriety in the next report.

The permission for pupils other than those of the Government Colleges, to compete for scholarships, is beginning to have some effect. In the Agra College two, and in the Delhie College four scholarships, Arabic, Sanscrit, and Persian, were awarded.

* Page 2 of Report for 1849-50.

The following Statement gives an abstract of the number of students at each institution, of their studies, and of the average expense incurred for each pupil.

Names of Institution.	Students on the 30th April 1852.				Studying.				Total expenditure during the official year 1851-52.	Average expense incurred for each pupil.	Remarks.
	Christians.	Moosulmans.	Hindoos.	Total.	Persian.	Hindee.	Sanscrit.	English.	R. A. P.	R. A. P.	
Agra, ...	34	49	269	352	118	83	21	323	33434 2 8	94 15 8	
Benares, ..	5	18	319	342	57	103	103	222	41602 4 8	121 10 0	
Delhic, ..	20	93	222	335	52	41 Arabic.	24	218	41069 3 6	122 10 6	
Bareilly, ..	6	63	233	302	67	19	0	*216	19349 1 3	64 1 1	* Including Oordoo.
Ajmere, ..	0	65	205	270	108	46	32	84	13680 0 0	50 10 8	
Saugor, ..	21	30	178	229	78	78	†0	73	8750 15 3	38 3 5	† Not given.
Total, ..	86	318	1426	1830	180	369	180	1136	157905 11 4	86 4 7	

The proceedings of Mr. H. S. Reid, for the promotion of vernacular education in eight selected districts, have been carried on throughout the year under report with energy and success. A statement of his labours is published separately, and will be circulated similarly with the present volume.

At the close of the report will be found an interesting statement drawn up by Mr. Ledlic, the Curator of Government School Books, upon the operations of his department throughout the year, with suggestions for increasing its efficiency.

AGRA COLLEGE.

29TH YEAR.

LOCAL COMMITTEE OF PUBLIC INSTRUCTION AT AGRA, ON THE 30TH APRIL 1852.

NAMES.	DESIGNATION OF OFFICE.
J. S. Boldero, Esq., --	Civil Service.
W. Muir, Esq., -- --	Secretary to Government, N. W. P.
J. Thornton, Esq., --	Member Sudder Board of Revenue, N. W. P.
M. R. Gubbins, Esq., --	Magistrate and Collector of Agra.
P. B. Reid, Esq., --	Depy. Magte. and Depy. Col. of Agra.
S. S. Brown, Esq.,	Judge of the Sudder Dewanny and Nizamut Adawlut, N. W. P.
F. B. Pearson, Esq.,	Register of the Sudder Dewanny and Nizamut Adawlut, N. W. P.
Dr. J. Murray, -- --	Civil Surgeon of Agra.
H. S. Reid, Esq., --	Visitor General of Schools, N. W. P.
G. J. Christian, Esq., --	Secy. Sudder Board of Revenue, N. W. P.
E. H. Morland, Esq., --	Civil and Sessions Judge of Agra.
J. Middleton, Esq., --	Secy. Local Committee of Pub. Instruction.

The number of students at this institution has decreased during the past year, the average number on the rolls being 376 against 407 of the former one. The Principal attributes this to the fact that new schools have been established in and about Agra, and others raised to efficiency by private individuals and religious bodies, at which no payment, or at most a nominal one, is demanded. He mentions in particular one, which, as it affords encouraging hope that the educational principle is taking root of itself amongst the people, may be here also specified. An ex-student of the College, by name Kishen Lall, has opened a Free School in the City, at which between 50 and 60 youths are taught the English and Vernacular languages, and rudiments of science by an adequate staff of masters. The Principal of the College, who has visited this school, speaks favourably of its condition, and of the spirit in which it is conducted. Whilst, however, the numerical strength of the students is somewhat lessened, it is gratifying

to observe that as many as twenty have come from a distance to avail themselves of the advantages the College affords. Several changes have taken place in the educational staff of the College. The Arabic Moulvi having been appointed Ameen of the Calcutta Madrussa, Moulvi Ali Akbar was chosen in his place. Mr. Parsick, who was teacher of surveying, accepted the offer of a Tehseeldarship, and was succeeded by Mr. F. Hembrough, whilst Mr. A. Sharpley took his place as 4th Master, that position being vacated by Mr. Wiggins, who had joined the Ajmere School as its Head Master. It will be observed from the return, that a considerable number of students have withdrawn in consequence of obtaining public or other employment; the advanced students of the senior class left about the beginning of the session, and as those who remained were mostly of recent promotion, the usual reach of attainment on the whole has not been made. Besides the appointments noted in the return, other applications for educated youths have been made, which on account of the exhaustion of the senior class, the College was unable to meet.

The average daily attendance of the students has been satisfactory. The number of paying students has increased very little during the past year, the number being 240 to 233 of the previous one. The income derivable from this source has become less; the reason of this is, that the number of students paying small fees has increased, but that of those paying the higher fees has decreased. The Library has received some valuable additions in the way of works of reference, such, for instance, as the Journals of the Asiatic Societies of Bengal and Paris, the Transactions of the Asiatic Society of Bengal, &c., &c. A few trifling additions have been made to the stock of scientific apparatus. The progress of the surveying class during the session has not been considerable. This may be partly attributed to the resignation of Mr. Parsick, and the long time which intervened before his successor arrived, namely, from April to October; and partly to the circumstances that the work was new to many of the students. However, Mr. Hembrough made the best use of the limited time remaining, by instructing the class in the construction and use of surveying instruments. The Statistical Returns will be now given, which exhibit a complete view of the present circumstances of the College.

Establishment of the Agra College as it existed on the 30th April 1852.

Date of Appointment.	Names.	Designation.	Amount of Salary.
1st February 1845,	J. Middleton, Esq., ..	Principal, ...	600 0 0
25th April, 1844, .	Mr. J. K. Williams, ..	Head Master, ...	400 0 0
25th April, 1846, .	Mr. J. F. McConnell, ..	Second ditto, ...	200 0 0
31st March, 1851,	Mr. J. W. Beale, ...	Third ditto, ...	130 0 0
8th April, 1851, ..	Mr. A. Sharpley, ...	Fourth ditto, ...	100 0 0
20th Feb., 1847,	Kedarnath, ...	Fifth ditto, ...	50 0 0
	Kulyan Singh, ...	Sixth ditto, ...	25 0 0
5th Feb., 1852,	Mool Chund, ...	Seventh ditto, ...	16 0 0
	Sheodial, ...	Eighth ditto, ...	14 0 0
28th Dec., 1842,	Mr. J. F. McConnell, ..	Writing ditto, ...	30 0 0
9th August, 1851,	Mr. F. Hembrough, ..	Drawing ditto, ...	200 0 0
7th April, 1852, ..	Koonje Behar, ...	Assistant Mathematical Professor,	34 0 0
7th April, 1851, ..	Moulvee Ali Akbar, ..	Arabic Professor, ..	100 0 0
21st Jan., 1847, ..	Abool Hussun, ...	1st Persian Teacher,	60 0 0
19th August, 1821,	Mahomed Raheem, ...	2nd ditto ditto, ..	30 0 0
5th Feb., 1850,	Kureemoodeen, ...	1st Oordoo Teacher,	50 0 0
	Ali Asghur, ...	2nd ditto ditto, ..	30 0 0
3rd Sept., 1850, ..	Gholam Dustgeer, ...	3rd ditto ditto, ..	14 0 0
19th August, 1824,	Kewul Ram, ...	1st Sanscrit Teacher,	60 0 0
15th March, 1841,	Heera Lall, ...	2nd ditto ditto, ..	20 0 0
3rd Nov., 1848, ..	Munnoo Lall, ...	1st Hindee Teacher,	50 0 0
8th August, 1848,	Kesho Pershad, ...	2nd ditto ditto, ..	30 0 0
8th Sept., 1826, ..	Choonnee Lall, ...	3rd ditto ditto, ..	20 0 0
15th Aug., 1825,	Shunkur Lall, ...	Hindee Arithmetic do.	30 0 0
	Establishment.		
30th January 1849,	Naseer Khan, ...	Librarian, ...	25 0 0
3rd May, 1841, ..	Chunnoo Lall, ...	English Writer, ..	16 0 0
		2 Duftrees, at 5 & 4,	9 0 0
		1 Furrash, ...	5 0 0
		1 Bhisty, ...	7 0 0
		1 Chupprassy, ...	4 0 0
		2 Choukeydars at 4, ..	8 0 0
		2 Brahmins, at 3-8, ..	7 0 0
		1 Sweeper, ...	4 0 0
		Contingencies, ...	4 0 0
		Total Co.'s Rs., ..	2382 0 0
29th Feb., 1848, ..	Mr. S. W. Fallon, ...	Supernumerary, ..	250 0 0
		Grand Total, Company's Rupees, ..	2632 0 0

Statement of the Number, Caste, &c. of the Students of the Agra College, on the 30th April 1852.

Statement showing the number of Students paying, and the amount paid by them; and Students who do not pay; as also the amount of Entrance Fees on the 30th April 1852.				*Statement showing the number of students studying each of the languages taught, on 30th April 1852.*						*Statement showing the number of Students on the 30th April 1852.*			
Non-paying.	Paying and amount realized during the year, deducting the expense of collection.	Amount of Entrance Fees realized during the year.	Total.	English.	Arabic.	Persian.	Oordoo.	Sanscrit.	Hindee.	Christians.	Mahomedans.	Hindoos.	Other than these three.
102	16 at 5 Rs. each. 4 at 3 Rs. each. 21 at 1 Re. each. 209 at 8 As. each. 250 R. A. P. 2211 8 0 96 0 0 2115 8 0	R. A. P. 208 0 0	R. A. P. 2323 8 0	323	A 19	B 118	C 171	D 21	E 83	34	49	269	0
										Total, .. 352			

A—Of these 5 read Persian and 8 English.
B—Ditto 6 ditto Arabic, 10 Oordoo, and 99 English.
C—Ditto 1 ditto ditto, 10 Persian, 1 Sanscrit, 2 Hindee, and 157 English.
D—Ditto 4 ditto ditto, 3 Hindee, and 14 English.
E—Ditto 6 ditto ditto, 4 Persian, and 70 ditto.

Statement of the Receipts and Disbursements of the Agra College, during the official year 1851-52.

Resources of Annual Income.

Separate Fund.		Assignment from Parliamentary Grant.	* Total.	Assignment from Additional Grant.	Establishment fixed by Government.	† Tuition Fees.	Grand Total of Receipts.
Endowment, Village Collections from the Estate of the late Gungadhur Pundit, under orders of Government, dated 7th November 1823, viz.							
Jhoondary, zillah Agra, ...	4323 8 1						
Choomoha, zillah Muttra, ...	5809 10 10						
Villages in zillah Allyghur, ...	6537 2 7						
Interest on Rs. 1,78,400, as per General Committee's Report for 1942-43,	7466 10 8						
	24137 0 2	0 0 0	24137 0 2	14733 5 4	34300 0 0	2323 8 0	41193 13 6
Total Company's Rupees, ...							41193 13 6

Actual Charges during the Year.

Nature of Charges.	Items.	Total.
Principal, ...	7200 0 0	
English Teachers, ...	13534 6 1	
Vernacular ditto, ...	5729 6 11	
Establishment, ...	1020 0 0	
English Scholarships, ..	912 0 0	
Oriental ditto, ...	1360 0 0	
Prize Allowance English Department, ..	150 0 0	
Ditto Oriental ditto, ..	150 0 0	
Contingencies, ...	249 6 8	30375 3 8
Supernumerary Master's Salary, ...	3000 0 0	3000 0 0
Postages, ...	128 15 0	128 15 0
Total Co.'s Rs., ...		33434 2 8

Exclusive of the following Items:

Balance of last Year, ...	672 11 10
Prize Allowance for both Departments, ...	300 0 0
Fines realized, ...	127 2 2
Books sold, ...	793 15 0
Refund from one of the Students for a Medal, ...	100 0 0
Postages from Government, ...	118 2 0
Exchange on Remittances to England, ...	10 14 0
Admission Fees, ...	208 0 0
Tuition ditto, ...	2211 8 0
	4542 5 0
Expended for Books, Stationery, Apparatus, Furniture, Collection of Fees, &c., &c., &c., ...	4209 14 5
Balance 1st May 1852, Co.'s Rs.	332 6 7

† Monthly Fees for Tuition, ...	2211 8 0
Admission ditto, ...	208 0 0
	2419 8 0
Deduct.	
Expenses of Collection, ...	96 0 0
Balance Company's Rupees, ...	2323 8 0

Statement exhibiting the Comparative Numerical Strength of the Agra College, on the 1st December 1850 and 1st December 1851.

English Department.			
Number on the Rolls on the 1st December 1850, ...		379	
New admissions during the year,	63		
Re-admissions, ditto,	42	105	484
Removals, ditto, ...		.. ..	148*
Number on the Rolls on the 1st December 1851, ...		.. ..	336
Oriental Department.			
Number on the Rolls on the 1st December 1851, ...		14	
New admissions during the year,	10		
Re-admissions, ditto,	2	12	26
Removals, ditto, ...		.. ..	7†
Number on the Rolls on the 1st December 1851, ...		14	19
Total of both Departments, ..		.. ..	355

* Of these 19 have obtained employment; 69 resigned through protracted sickness, or left the Station; 58 struck off for absence; 1 transferred to the Oriental Department, and 1 expelled for theft, Total 148.

† Of these 1 has gone to Roorkee College; 2 resigned; 3 absent and struck off, and 1 transferred to the English Department. Total 7.

Note.—Included in the re-admissions are 22 in the English Department, who were struck off during the year.

List of students who have come from distant places, and have been admitted into the Agra College in 1851.

No.	Names.	Place of Abode.
1	Kanjee Mull, ...	Alwur.
2	Kan Singh, ...	Ditto.
3	Bukhtawur Singh, ...	Ditto.
4	Balmokund, ...	Jeypore.
5	Hukeemoodeen, ...	Muttra.
6	Haith Lall, ...	Etmadpore.
7	Mookhta Pershad, ...	Coel.
8	Kedar Nath, ...	Baraset.
9	Basdeo, ...	Karoul.
10	Heera Singh, ...	Pahoo.
11	Doorga Pershad, ...	Futtiabad.
12	Madari Pershad, ...	Shekoabad.
13	Shoba Ram, ...	Muttra.
14	Luchmun Singh, ...	Alwur.
15	Luchmi Narain, ...	Moradabad.
16	Dwarka Pershad, ...	Coel.
17	Abdool Singh, ...	Futtehpore.
18	Dwarka Das, ...	Karoul.
19	G. Lambert, ...	Futtehgurh.
20	Juttun Lall, ...	Boodee.

Return showing the Comparative Regularity of attendance of the students of the Agra College, during the years 1850 and 1851.

Average number on the Rolls, during 1850, ...	407
Ditto attendance, ditto, ...	388
Ditto number on the Rolls, ditto, 1851, ...	376
Ditto attendance, ditto, ...	358
Per Centage of attendance during 1850, ...	95·44
Ditto ditto, ditto 1851, ...	95·08

Comparative Statement of the paying Students of the Agra College, at the close of the years 1850-51.

	1850.				Total Monthly.	1851.				Total Monthly.
	Paying.					Paying.				
	5 RS.	3 RS.	1 RE.	8 AS.	R. A. P.	5 RS.	3 RS.	1 RE.	8 AS.	R. A. P.
Christians. ..	10	6	7	12	81 0 0	8	3	9	14	65 0 0
Hindoos, ...	2	2	17	160	113 0 0	1	1	15	162	104 0 0
Mahomedans,	0	0	1	16	9 0 0	1	0	1	25	18 8 0
Total, ..	12	8	25	188	203 0 0	10	4	25	201	187 8 0

List of Students of the Agra College, who have obtained employment during the year 1851.

No.	NAME.	CLASS.	NATURE OF EMPLOYMENT.	MONTHLY SALARY.
				R. A. P.
1	A. Sharpley, ...	1st,	Fourth Master, Agra College, ...	100 0 0
2	Ameer Khan, .. .	1st,	Office of Post Master General, N. W. P.,	100 0 0
3	Sookhdeo Buksh, ..	1st,	Master in the Ajmere Govt. School, ..	80 0 0
4	Jugut Narain, ...	1st,	Mohurrir Session Judge's Office, Agra, 20, and the same sum as private teacher, ...	40 0 0
5	Doorga Pershad, ..	2nd,	Private Teacher to a Raja, ...	25 0 0
6	Goor Sahoy, ...	2nd,	His Highness the Rajah of Bhurtpore's Survey, ...	25 0 0
7	Bhola Nath, ...	3rd,	Secundra Press, Agra, ...	12 0 0
8	Bisheshwar, ...	3rd,	Accountant's Office, N. W. P., ..	15 0 0
9	Pultoo Ram, ...	3rd,	Teacher Benevolent Institution, Agra, ..	10 0 0
10	Sunhurry Chunder,	4th,	Civil Auditor's Office, N. W. P., .	15 0 0
11	Gouree Shunker, ..	4th,	Ameen, Collector's Office, Agra, ..	10 0 0
12	Roop Ram, ...	4th,	Private Hindi Teacher, ...	8 0 0
13	Kedarnath Bose, ..	5th,	Office of Superintendent, Jhansi, ..	25 0 0
14	Gunga Pershad, ..	5th,	Private Moonshee to some Officers at Agra, ...	20 0 0
15	Kishen Dyal, ...	6th,	Apprentice Collector's Office, Agra, ..	0 0 0
16	Omrao Ali, ...	7th,	Nukkul Nuvees, Office Principal Sudder Ameen, Agra, ...	Section Rates.
17	Kulyan Singh, ...	8th,	Sherishtadar, Sessions Judge's Office, Meerut, ...	50 0 0
18	Vajid Ali, ...	8th,	Librarian to Principal of Mahomedan College, Calcutta, ...	10 0 0
19	Motee Ram, ...	8th,	Secundra Press, Agra, ...	3 0 0
			ORIENTAL DEPARTMENT.	
1	Fyzoolla Khan, ..	Arabic,	College of Engineering, Roorkee, ..	0 0 0

The Examination began on the 14th of November, and continued till the 20th of the following month. Its results are thus given in detail:

ORIENTAL DEPARTMENT,

Indian Branch.

1st Sanscrit class.—This class is taught by Pundit Kewul Ram, and consists of 15 students. The answers to the papers of the seven senior youths were examined by Dr. Ballantyne, who writes "of the seven students, the first four at all events deserve scholarships. It may seem strange that Shiv Rukshaka, who has a high number for his examination in the *Manorama*, should have a low one for his replies to questions in the *Kaumoodi*, which is the text of the *Manorama;* but he explains in his paper that he was pressed for time."

2nd (Junior) Sanscrit class.—Pundit Heera Lall teaches 17 boys in this class; besides these, a clever little boy, belonging to the seventh English class, requested to be examined along with them, and acquitted himself creditably, though he had not, it is true, read much: he is instructed at home by his father.

No student of this class is sufficiently advanced to deserve either scholarship or promotion: the three senior youths make little or no progress, and indeed appear only to study Sanscrit in compliance with the wishes of their parents.

1st Hindee class.—This class contains thirty-three students, and is taught by Pundit Manu Lall. The students exhibit great zest, and the principal Sanscrit Pundit who examined them, reported favourably on their general attainments, and especially so on their hand-writing.

2nd Hindee class.—This class of 16 students reflects great credit on Pundit Kesho Pursad, its teacher; one of its best boys is a Mahomedan, a lad of much promise, who possesses considerable attainments in Arabic, and is now persevering in English studies also.

3rd (Junior) Hindee class.—This class consists of 24 students, and is taught by Pundit Chunni Lall. The youths acquitted themselves creditably generally, the senior ones particularly so, a little more attention to spelling however would be beneficial.

Persian Branch.

Arabic Class.—This class, consisting of 14 students, is taught by the Arabic Professor Ali Akbar. Dr. Sprenger, who examined the answers of the five best students reports, that "the pupils have made considerable progress in Arabic literature, and in other sciences they are as they were. This reflects great credit on Moulavi Ali Akbar, for it appears to me, that

the study of logic for instance, ought not to be carried too far, whereas the study of literature cannot be carried far enough."

Mr. William Muir reports also favourably of the answers of the junior students, and says of the exercises in Mutnubee and Hureeree that "they were done with remarkable ability. Roohoolla rendered his task into elegant Oordoo, and Zamin Ali his into correct and good Arabic."

1*st (Senior) Persian class.*—This class consists of 58 students: its teacher is Munshee Abul Hussan. It was examined partly *vivâ voce;* and partly on paper, by Moonshee Syud Mahomed, of the Dehlie College. With the exception of ten students, all gained at least half the maximum marks, and the greater part far more than half. The state of the class, as inferible from this, would appear to be creditable.

2*nd (Junior) Persian class.*—This class, teacher Moonshee Mahomed Raheem, consists of 80 students, and is divided into several sections. In each of these a few of the senior boys acquitted themselves very well; but Mr. Fallon and the Senior Persian Professor, the examiners, remark upon the general deficiency of the others. Still on the whole, the class seems to have improved since the last examination.

1*st Oordoo class.*—The teacher of this class is Moonshee Kareemood-deen, and it consists of 67 students. The Arabic and Senior Persian Professors examined the class generally, and their report was favourable. Mr. William Muir, to whom a few youths of various standing in the class were sent for examination, remarked "that they almost all read well, and understood what they read."

2*nd Oordoo Class.*—This class, taught by Moonshee Ali Asghur, consists of 52 students, all of whom learn English. The reading of this class, on examination, was considered good; as also their explanation, but it was observed that the lower boys had been comparatively neglected, a fault which required correction.

3*rd Junior Oordoo Class.*—Moonshee Gholam Dustgeer has this class. It consists of 79 students, all of whom learn English also, and is in a creditable state. More care should however be taken with the pronunciation, a point of importance with a junior class, as a habit of indistinct speaking may be easily acquired, which it is difficult afterwards to throw off.

ENGLISH DEPARTMENT.

1*st Class.*—(See afterwards Senior Class.)

2*nd Class.*—This class consists of 24 students. The Reading and Explanation taught by the Head Master were found to be tolerably good, but the grammar on the other hand, indifferent. The

Mathematics of this class are taught by the Assistant Professor,* and the method he appears to pursue of teaching, namely, paying most attention to the quick boys, tells very unfavourably on the general attainments of the whole number.

The History does great credit to Mr. McConnell, and the Geography is much better than last year, which is observed with satisfaction, as this branch of instruction has heretofore not received the attention it demands in the senior classes.

One boy, Saligram, has so far outstripped his fellows as to entitle him to particular mention. It is to be hoped he will consider past success only as a stimulus to future exertion.

3rd Class.—This class consists of 26 students, and is taught in Literature Proper and History by Mr. McConnell, in Geometry, Algebra and Arithmetic by Assistant Professor Ishry Purshad, by Mr. J. Beale in Geography, and by Mr. Fallon in Anglo-Vernacular Translation. The class was examined in Reading, Explanation and Grammar by Mr. P. B. Reid, who remarks: "I am happy to be able to say that this class, in the branches of study in which I examined it, was decidedly better than it was last year. The Explanation was very good, the Grammar fair. I consider Kanjee Mull much the best in the class." Though a marked improvement was observable in the Geometrical demonstrations, still the general proficiency in Mathematics is sadly impeded by the Assistant Professor's defective method of teaching.

4th Class.—This class numbers 22 students, and is taught by Mr. J. Beale in all subjects excepting Geometry. The Grammatical Exercises were thought careless, but the equality of attainments amongst the boys shows great painstaking on the part of the Teacher, in which respect the contrast in the Assistant Professor's subject is unfavourable to him.

5th Class.—This class consists of 29 students, and Mr. Sharpley is its teacher. It does him great credit; there is perhaps room for improvement in the rendering of English passages into Oordoo and *vice versâ.*

6th Class.—Pundit Kulyan Sing is the teacher of this class, which numbers 52 students. It is divided into two Sections of 26 each. Both these are occupied half the day with Oriental, and half with European studies. The Reading and Pronunciation of this class are good. The second division somewhat failed in consequence of the Pundit having himself mistaken the sense of the passage which happened to be given them for translation. More attention is required also to their Grammar.

* His connexion has since ceased with the College.

7th Class.—54 students, thus divided: a senior part of 22, and a junior of 32 boys. The Teacher is Moonshee Nejabut Alec.* An improvement is observed in the pronunciation, but care must be taken to prevent too free and loose construing of English, a habit hostile to accuracy. The Writing of this class is tolerably good, and their Arithmetic neat and accurate.

8th Class.—This class is taught by pundit Moolchund, it consists of 58 students; there being two divisions, a senior one of 25, and a junior of 33. The explanations were accurate and idiomatic, and the reading tolerably good: occasional mispronunciation of initial "s" and of "v" was however noticeable; the hand-writing was good, as also the Arithmetic, and on the whole the class is creditable to its teacher.

9th Class (Junior).—Pundit Kedarnath teaches this class. It numbers 63 students, and its condition is very creditable to the Pundit.

Pronunciation has been carefully attended to. The two sections of this class alternate their Oriental and European studies, when one division goes to Mr. Beale, the other remains with the Pundit, and *vice versâ.*

THE SENIOR CLASS.

At the time of the examination this class consisted of 11 students. At the beginning of the year, there were 16, and one was promoted to it at midsummer, so that six had left in the course of the year. There was no youth remaining in it who was holding a senior-scholarship, nor, as the result of the examination showed, qualified at present to do so. But several of the students are youths of great promise, who will, it is to be hoped, soon retrieve the character of the class. Amongst them may be foremost mentioned, Mr. R. Forrest, who, though only a beginner in Mathematics, deserves great credit for his general attainments.

The Literature Proper, History and English Composition are taught by the Head Master. Mathematics, Pure and Mixed, by the Principal, who also delivers a course of Lectures twice a week, on Natural Philosophy.

The Anglo-vernacular exercises are superintended by Mr. Fallon, and the Surveying and Drawing by Mr. Hembrough.

At the time of the examination, the class consisted of 11 youths.

* Since dead.

Azim Buksh, Sheikh of Benares.
Hurjhian Singh, brahmin of Agra.
Debi Das, Khuttri of Agra.
Kunjbaharee, brahmin of Mynpooree.
E. Hutton, European, of Agra.
R. Forrest, ditto, of Agra.
Shib Charran, Kayath of Calcutta.
Balmokund, brahmin of Agra.
Oobhachurn, brahmin of Bengal.
G. W. Cline, European, of Agra.
Kunhya Lal, bunniah of Agra.

Mr. M. Gubbins undertook the *vivâ voce* examination in Literature Proper, and considered the result as "decidedly satisfactory."

In favourably reporting of the reading he remarks: "The good accent of the native pupils who have studied for any length of time in the College, particularly attracted notice."

The explanation of Forrest and Balmokund elicited praise.

Grammar was not quite so good.

Mr. Gubbins concludes, "I have much pleasure in complimenting Mr. Kyffin Williams upon the favourable impression received by me from the examination of his pupils."

The written answers to the papers on this subject were examined by Mr. J. W. Sherer, who says: "Forrest is, I think, easily the best, and his are very respectable performances. Hutton seems better than Cline: the former's Macbeth paper is very fair. The three Europeans are much above any of the natives. Amongst the latter, Balmokund, Kunhya Lal and Hurjhian Singh appear pretty even. Azim Buksh has not, I think, done his best, and Kunjbahari's handwriting is very indistinct. Altogether the answers appear to me to be up to usual standard this year, and Forrest's perhaps above it."

Mr. J. Thornton gave as theme for the Essay, "The two ends of Education are to impart knowledge and to form the character, which of these two is the most important, and why?"

He reports of the Essays: "Forrest's is undoubtedly the best. There does not seem to me to be much difference between the other two (those of E. Hutton and Hurjhian Singh), though on the whole, Hutton's may be considered entitled to the preference."

Mr. Thornton remarked that all the Essays touched on the effect of Education on the moral character and did not interpret "character" in the large sense in which he had used it.

He goes on to say, "The composition and hand-writing of all these Essays are very fair. The English youths of course excel in these respects. But they seem also to have a readier flow of thought than the native boys of similar or even greater age. If this is generally the case, to what cause must it be attributed? there are two possible explanations. One—that English boys have a greater facility in reading and understanding the books from which materials for thought are chiefly to be obtained. The other, that they write in the language in which they think, whereas the others have to think and translate at the same time. Whatever may be the cause, is it not rather discouraging to the native boys to be always surpassed in this particular (the Essay) by their English fellow-students? If so, it might be well to assign a somewhat inferior prize for competition among the natives alone, leaving the chief prize open to all as it is now."

The answers to the Mathematical papers were on the present occasion much below the usual standard. Though the number of questions was lessened, as it appeared to the Committee to be too great, yet those which remained were very indifferently valued. Azim Buksh, the only student remaining in the class who had advanced into the higher branches, gave much the best answers. The style of Mathematical composition of this youth shows marked improvement since last year, nevertheless the absolute merit of the answers is not high.

Of the Anglo-Vernacular examination papers, Mr. W. Muir reports unfavourably.

He says "The exercises given were by no means difficult. Two passages from the Bagh-o-Bahar and the Akhlak-i-Jelaly were set for translation from Oordoo into English, and one from Richards on India for translation into Oordoo."

Forrest and Hutton rendered the Bagh-o-Bahar very well into English, but the native lads (from an imperfect knowledge of English apparently) in a very indifferent manner. The exercises from the Akhlaq-i-Julalee were equally ill done. In the exercise from English into Oordoo the whole class failed most egregiously, and the orthography and writing were in general of the worst description." After remarking that some excuse might be made for the English boys, which however would not screen the native students, Mr. Muir says of the latter: "I cannot look for their exercising much influence on their fellow-countrymen by reason of their English education and superior enlightenment, until they take the trouble to acquire, (I do not say a high degree in vernacular literature, but) simply the faculty

of being able to record their ideas in respectably written Hindoostanee."

Notwithstanding, however, the discouraging result of the examination, Mr. Muir was inclined to recommend Debi Dass, whose translations were the best, for a scholarship, taking into consideration his position as an English student, and the importance of encouraging combined attention to Oordoo and English.

In Paley's Natural Theology, the answers to the questions were accurate so far as the book went: but the answers to the questions set with the view of testing how far the youths think for themselves about what they read, were utterly worthless, with exception perhaps of those of Master R. Forrest.

The same remarks apply to the papers on Political Economy. The technicalities had been mastered, in both subjects, and no more.

In History, Mr. F. B. Pearson reports that even the best answers did not obtain more than half the maximum marks he had fixed. Still he would make allowances for the difficulty and scope of the questions. Forrest he considers far the best, and his papers, on the whole, highly creditable to him. He mentions also with approval Debi Dass, Cline and Koonj Beharee, but remarks on the bad spelling and writing in the inferior papers.

The answers to the Blackstone paper were gone over by Mr. R. Alexander (of Muttra), who says regarding them: "I have no experience of Indian College examination papers, so that I cannot give by comparative standard an opinion of any value in regard to these: but they seem to me to be very fair papers, and to show that the youths had not been reading for nothing."

SCHOLARSHIPS.

None of the students in the English Department were thought qualified for senior scholarships. Three competitors from without for scholarships in the Senior Persian and Sanscrit class presented themselves, one a student in the Church Missionary College at Agra, another Gholam Hyder from Futtiabad, and a third Ishry Pursad. A Junior Persian scholarship was awarded to Gholam Hyder, and a Junior Sanscrit one to Ishry Pursad.

The following are the scholarships which have been awarded for the present year.

List of Scholarships awarded in the English and Oriental Departments of the Agra College, consequent on the Annual Examination for the year 1851.

No.	English Department.	Amount Monthly.			No.	Oriental Department.	Amount Monthly.		
	Junior Scholarships.					*Arabic.*			
		Rs.	A.	P.			Rs.	A.	P
1	R. Forrest, ...	8	0	0	1	Niaz Ali, Sr. Scholarship,	16	0	0
2	Balmokund, ...	8	0	0	2	Sufder Ali, ditto ditto, ..	16	0	0
3	E. Hutton, ...	8	0	0	3	Ruttun Lall, Junior ditto,	6	0	0
4	Saligram, ...	8	0	0	4	Zuman Ali, ditto ditto, ..	6	0	0
5	Oma Churn, ...	8	0	0		*Persian.*			
6	Shib Dial, ...	6	0	0					
7	Kunhya Lall,..	6	0	0					
8	Raja Ram, ...	6	0	0	1	Roohoola, Sr. Scholarship,	16	0	0
9	Khamani Singh, ...	6	0	0	2	Gholam Murtaza, Jr. do.,	6	0	0
10	Saligram 2nd, ...	4	0	0	3	Shio Narain, ditto ditto,	6	0	0
11	Shio Narain, ...	4	0	0	4	Mookhta Pershad, ditto,	4	0	0
12	Jumna Das, ...	4	0	0	5	Kishen Narain, ditto, ..	4	0	0
					6	Gholam Hyder, ditto, ..	4	0	0
						Sanscrit.			
1	Koonj Beharry (the Maha Raja of Bhurtpore's Scholarship), ...	16	0	0	1	Luckshmi Narain, Sr. do.,	16	0	0
					2	Kali Churn, ditto ditto,	12	0	0
					3	Dwarka Das, ditto ditto,	12	0	0
	Anglo-Vernacular.				4	Shio Rakhun, ditto ditto,	12	0	0
					5	Sookhdao, Junior ditto, ..	6	0	0
1	Dabi Das, Junior Scholarship, ...	8	0	0	6	Popeeram, ditto ditto, ..	6	0	0
					7	Ishry Pershad, ditto, ..	4	0	0
	Total Co.'s Rupees, ..	100	0	0		Total Co.'s Rupees, ..	152	0	0

RECAPITULATION.

	Rs.
Government English and Anglo-Vernacular Scholarships	84
The Maha Raja of Bhurtpore's ditto, ...	16
Government Oriental Scholarships,..	152

The Committee concluded their Annual Report in these words:

"Considering the general satisfactory state of the classes, and bearing in mind that the deficiencies of the Senior English class are perhaps sufficiently accounted for by the withdrawal of the more advanced students at the beginning of the Session, coupled with the fact that those who would otherwise have taken their place had mostly left during the previous year, when the middle of the class was greatly weakened, the Committee think the state of the College may be considered satisfactory."

DEHLIE COLLEGE.

60TH YEAR.

RETURN OF THE LOCAL COMMITTEE PUBLIC INSTRUCTION ON THE 30TH APRIL 1852.

NAMES.	DESIGNATION OF OFFICE.
Sir Theophilus Metcalfe, Bart.	Agent to Lieut. Governor, N. W. P, and Commissioner of the Dehlie division.
A. Ross, Esq., -- -- --	Civil Surgeon.
A. A. Roberts, Esq., -- --	Magistrate and Collector of Dehlie.
H. Lewis, Esq., -- -- --	Commissary of Ordnance.
Moulawi Sudder-ood-deen, --	Principal Sudder Ameen.
Rai Ramsurn Dass, -- --	Deputy Collector at Dehlie.
Nuwab Hamud Ali Khan.	
J. Cargill, Esq., -- -- --	Secretary.

The Principal reports the following changes to have taken place during the past year in the establishment of the College.

Ajoodhia Pershad, second teacher of European Science through the medium of Oordoo, left the College on the 25th of April to take charge of the duties of Head Master of the Experimental School established by Government at Umritsur, on a salary of Rs. 150 per mensem, in which appointment he was subsequently confirmed. Arithmetician Radha Kishen was, with the sanction of Government, appointed to officiate in his stead in this College, and was afterwards, when it became known that Ajoodhia Pershad would not return, permanently retained in that situation. Senior Scholar Zakaoollah was appointed to officiate for Arithmetician Radha Kishen, and was likewise subsequently confirmed. Monitor Prem Narain left the College on the 27th of April for the appointment of 2nd Master in the Indore School, and Ameer Ali, formerly a junior scholar of this College, was appointed to the vacant situation. Pundit Ramchunder, 1st Sanscrit Teacher, obtained leave for six months, from the 20th of July to the 20th January 1852, and Pundit Ghasee Ram, who had formerly been monthly examiner in the Sanscrit Department, was appointed to officiate during his absence. Moulvee Mumlook-ool Ali, first Arabic Teacher, who had been connected with this Institution since its establishment, had always ably and faithfully discharged his duties, and had gained the respect and esteem of his official superiors, and, I believe I am fully justified in adding, of the Local Committee of Public Instruction, died on the 7th of October. Moulvee Syud Mohumed, formerly second, was then, with the sanction of Government, appointed first Arabic Teacher, and on the 10th of November, Moulvee Sobhan Buksh, the then third, was appointed second Arabic Teacher.

Establishment of the several Departments of the Dehlie College, as on the 30th April 1852.

English Department.

Names.	Designation.	Salary. Rs.	A.	P.	Date of Appointment.
J. Cargill, Esq.,	Principal,	600	0	0	1st July 1850.
F. Taylor, Esq,	Head Master,	500	0	0	16th August 1829.
Mr. E. Roberts,	2nd Ditto,	200	0	0	19th Sept. 1846.
Mr. R. Stewart,	3rd Ditto,	150	0	0	12th October 1843.
Mr. J. F. Goulding,	4th Do. & Dwg. Master,	150	0	0	4th July 1848.
Wuzzeer Ali,	5th Master,	50	0	0	12th April 1841.
Hoosinee,	6th Ditto,	40	0	0	1st May 1841.
Ramkishen,	1st Urdoo Teacher,	80	0	0	1st January 1841.
Sheopershad,	2nd Ditto ditto,	40	0	0	1st June 1833.
Noor Mahomed,	3rd Ditto ditto,	30	0	0	17th May 1841.
Taruck Nath,	Writing Master,	30	0	0	10th June 1838.
Radhakishen,	Nagree Teacher,	8	0	0	1st July 1841.
Shunker Doss,	Librarian,	25	0	0	5th April 1848.
Jeewun Ram,	English Writer,	13	0	0	5th Ditto 1848.
Noor Ali,	Duftri,	7	0	0	17th May 1841.
	3 Chuprassies, at 4,	12	0	0	
	1 Durwan,	4	0	0	
	1 Furrash,	4	0	0	
	1 Chowkeedar,	4	0	0	
	1 Sweeper,	3	0	0	
	Contingencies,	20	0	0	22nd January 1842.
	Prize Books,	20	13	4	4th January 1843.
	Oriental Department.				
Syed Mahomed,	1st Arabic Teacher,	100	0	0	1st June 1825.
Jafir Ali,	1st Shea Ditto,	100	0	0	1st April 1841.
Soobhan Buksh,	2nd Arabic ditto,	60	0	0	4th December 1834.
Vacant,	3rd Ditto ditto,	35	0	0	
Immam Buksh,	1st Persian ditto,	50	0	0	1st April 1841.
Hussun Ali Khan,	2nd Ditto ditto,	35	0	0	1st December 1830.
Kurreem Buksh,	3rd Ditto ditto,	25	0	0	21st January 1851.
Ram Chunder,	1st Sanscrit ditto,	60	0	0	24th April 1844.
Kidar Nath,	2nd Ditto ditto,	20	0	0	1st Ditto 1844.
Ram Chundra,	1st Scientific ditto,	100	0	0	28th February 1844.
Radhakishun,	2nd Ditto ditto,	50	0	0	21st January 1851.
Syed Mahomed,	Persian Writing and Nagree Teacher,	28	0	0	5th July 1829.
Zukkoollah,	Arithmetician,	20	0	0	12th Sept. 1851.
Jeewun Ram,	English Writer,	12	0	0	5th April 1848.
Radhakishen,	Treasurer,	10	0	0	16th April 1829.
Ashruf Ali,	Moonshi,	10	0	0	15th September 1831.
Ditto,	Librarian,	10	0	0	1st January 1833.
	4 Chuprassies, at 4,	16	0	0	
	1 Furrash,	4	0	0	
	1 Chowkeedar,	4	0	0	
	2 Bheesties, at 4,	8	0	0	
	1 Kuhar,	4	0	0	
	1 Gardener,	4	0	0	
	2 Sweepers, at 3,	6	0	0	
	Contingencies,	16	0	0	22nd January 1842.
	Prize Books,	20	13	4	4th January 1843.
	Total Co.'s Rupees,	2798	10	8	

No. 4.

Statement of the Number, Caste, &c., of the Students as on the 30th April 1852.

Statement showing the Number and Paying Students and the amount paid by them, and Students who do not pay, on the 30th April 1852.					*Statement showing the Number of Students stydying each of the languages on the 30th April 1852.*				*Statement showing the Number of Students on the 30th April 1852.*		
Non-Paying.	Paying.	Total. Rs.	A.	P.	English.	Arabic.	Persian.	Sanscrit.	Christians.	Mahomedans.	Hindoos.
	11 at 5 Rs. each. 1 at 3-12 Rs. each. 2 at 3 Rs. each. 12 at 1 Re. each. 1 at 12 annas each. 206 at 8 annas each.										
102	233	2097 48 2049	2 0 2	2 0 2	218	41	52	24	20	93	222
									335		

188 of the pupils in the English Department, and 22 of the Sanscrit Department, study Urdoo, 3 of the Persian Department study English, and 57 of the pupils in the English College and 73 of those in the Persian Department of the Mudrussa study Nagree.

The daily average attendance of the Students from the 1st May 1851 to 30th April 1852, is 195 in the English and 96 in the Oriental Department.

No. 5.—*Statement of the Receipts and Disbursements of the Dehlie College, from the 1st May 1851 to 30th April 1852.*

RESOURCES OF ANNUAL INCOME.

Separate Fund.		*Assignment from Parliamentary grant.*	TOTAL.	*Assignment from additional grant, dated 16th Dec. 1840.*	*Establishment and expenses as fixed by Government in their letter dated 16th Dec. 1840.*	*Additional grant in Prize Books, dated 4th January 1843.*	*Grand Total of Receipts.*
Escheat Fund,	3000 0 0						
Endowments from Nawab Itmad-ood-dowlah, ...	7253 5 4						
Total, ...	10253 5 4	8658 10 8	18912 0 0	21168 0 0	40080 0 0	500 0 0	40580 0 0

ACTUAL CHARGES FOR 1851-52.

Nature of Charges.	ITEMS.	TOTAL.
ENGLISH DEPARTMENT.		
Principal,	7200 0 0	
English Masters,	11280 0 0	
Drawing Master,	1800 0 0	
Vernacular Masters,	1800 0 0	
Writing Master,	360 0 0	
Nagree Master,	96 0 0	
Librarian,	360 0 0	
Establishment,	564 0 0	
English Scholars,	3928 0 0	
Contingencies,	365 12 6	
Prize Books,	250 0 0	
		27943 12 6
ORIENTAL DEPARTMENT.		
Arabic, Persian & Sanscrit Teachers,	6122 7 0	
Teachers of European Science,	1803 0 0	
Establishment,	1056 0 0	
Oriental Scholars,	3722 0 0	
Contingencies,	192 0 0	
Prize Books,	250 0 0	
		13145 7 0
Total Co.'s Rs., ..		41039 3 6

RECEIPTS.

Balance of last year 1851,	981 11 2
Fines realized,	359 10 6
Books sold,	1192 12 10
Tuition fees,	2097 2 2
Income of the College Garden,	86 0 0
Prize allowance for both Departments,	500 0 0
Contingencies,	432 0 0
Postage from Government,	56 1 6
Discount,	7 0 0
Total Company's Rupees,	5712 6 2

EXPENDED.

Prize,	18 7 0
Books purchased,	2764 15 8
Contingencies,	1029 4 10
Charges for realizing Tuition fee,	48 0 0
Monitor,	120 0 0
Balance,	1731 11 1
Total Company's Rupees,	5712 6 2

The following statement shows the number of paying and non-paying pupils in the month of December 1850 and 1851 respectively, and also the number of pupils who at the latter date were paying fees varying in amount from Rs. 5 to 8 annas. Among these are 17 Christian youths.

Department.	Free.	Paying.	Total.
English.			
December 1850, -- --	118	98	216
Ditto 1851, -- --	71	131	202
Arabic.			
December, 1850, -- --	36	6	42
Ditto 1851, -- --	30	13	43
Persian.			
December 1850, -- --	22	16	38
Ditto 1851, -- --	10	35	45
Sanscrit.			
December 1850, -- --	12	3	15
Ditto 1851, -- --	9	13	22

Paying Students in December 1851.						Rs.	A.	P.
13	Paying	@ Rs. 5 0	per month,	----	----	65	0	0
1	Do.	@ „ 3 12	Do.	----	----	3	12	0
1	Do.	@ „ 3 0	Do.	----	----	3	0	0
10	Do.	@ „ 1 0	Do.	----	----	10	0	0
1	Do.	@ „ 0 12	Do.	----	----	0	12	0
168	Do.	@ „ 0 8	Do.	----	----	84	0	0
194				Total Co.'s Rs.		166	8	0

This is Rs. 65-4 in excess of the fees for the month of December 1850.

5th.—The amount of tuition fees realized throughout the year is Rs. 2058-12-8, the amount due is 75, making a total of Co.'s Rs. 2133-12-8, which is an increase of Rs. 927-8 over the preceding year; but from this must be deducted the sum of Rs. 150-8 due from former years, but which has been in the present year recovered.

6th.—The following Statement shows the comparative number of admissions for the last four years.

	English.	*Arabic.*	*Persian.*	*Sanscrit.*	*Total.*
Admitted in 1848,	73	7	8	1	89
Ditto, -- 1849,	70	2	7	3	82
Ditto, -- 1850,	82	4	19	3	108
Ditto, -- 1851,	89	19	30	13	151

From the above it will be seen, that the number of admissions in all the Departments this year, has considerably exceeded that of any of the three foregoing years, and in all probability this is a pretty correct criterion of the increased demand for education in and about Dehlie. The reason why the number of pupils on the rolls has not increased in proportion to the greater number of admissions is, that from several causes, more pupils have left the College during the last year, than in almost any previous year. Many of those who failed to obtain scholarships left; many whose ages did not allow them to retain their junior scholarships left, and, in addition, it will be seen that the number of non-paying pupils diminished by 69 throughout the year. Again in 1851, the number of those who have obtained employment is unusually great. All these causes however will not be in operation during the year 1852, and a considerable addition to the number of pupils actually frequenting the College, may, I think, be fairly expected.

7th.—The following list gives, as far as could be ascertained, the names of the pupils of this College, who obtained employment during the past year. The list however is believed to be far from complete, unfortunately no register of the different departures from the College has hitherto been kept, stating the reasons of each departure. For the future such a register will be preserved; and thence will be ascertainable at a glance the precise proportion in which this College supplies the increasing demand for well educated persons in the different offices, public and private, throughout the country.

No.	Name.	Class.	Nature of Employment.	Amount of Salary. R.	A.	P.
1	Muckhund Lall, ..	1	Sheristadar, Bareilly Collectorate, ..	30	0	0
2	Mohomud Ali, ..	1	Writer, Post Master General, N. W. P.,	60	0	0
3	Mohomud Ishaq,..	1	2nd Teacher of the Umritsur School, ..	70	0	0
4	R. H. Roberts, ..	1	Roorkee College, ...	0	0	0
5	E. Foy, ...	1	Apprentice in the Surveyor Dept., ..	0	0	0
6	Nahur Sing,.. ..	1	Apprentice Dehli Collectorate, ...	0	0	0
7	Choonee Lall, ..	1	Overseer of Roads at Rohtuck, ...	50	0	0
8	Ladli Dass, ...	2	Apprentice in the office of Executive Engineer, Dehlie, ...	0	0	0
9	Jwala Nath, ...	2	Ditto ditto, ...	0	0	0
10	Peyaree Lall, ..	2	Writer to Sir T. Metcalfe, Bt. house, ..	10	0	0
11	Dya Shunker, ..	3	Apprentice Dehli Collector Customs Office, ...	0	0	0
12	Kunhia Lall, ..	3	Writer at the Dehli Post Office, ...	0	0	0
13	Hurgobind, ..	4	Compositor at the Dehli Gazette Press,	5	0	0
14	Shitab Ray, ...	4	Apprentice Dehli Collectorate, ...	0	0	0
15	Sheopershad, ..	4	Ditto ditto, ...	0	0	0
16	Moona Lall	4	Thanadar, ...	25	0	0
1	Mohomud Ali, ..	1 Arabic.	Purgunnah Visitor at Deobund, ...	30	0	0
2	Mohomud Hushun,	1 Ditto.	Nazir at the Dehlie Session Judge office	15	0	0
3	MohomudMooneer,	2 Ditto.	Teacher, Ajmere School, ...	30	0	0
4	Moheeooddeen, ..	2 Ditto.	Purgunnah Visitor at Saharunpoor, ..	30	0	0
5	Sheikh Ahmud, ..	2 Ditto	Senior Scholar at the Roorkee College,.	0	0	0
6	Abdool Hafeez, ..	2 Ditto.	Junior ditto ditto, ...	0	0	0
7	Mohun Lall, ..	3 Ditto.	Purgunnah Visitor at Nagoor, ...	30	0	0
8	Imdad Ali, ...	3 Ditto.	Moonshee of the Supdt. of Roads. ..	12	0	0
9	Abdoor Ruzzak, ..	3 Ditto.	Junior Scholar at the Roorkee College,.	0	0	0
10	Zakka Oolla, ..	1 Pern.	Arithmetician, Dehlie College, ...	20	0	0
11	Ummur Nath, ..	1 Ditto.	Teacher at Dehlie Bible School, ...	7	0	0
12	Kasim Ali, ...	1 Ditto	Ditto ditto, ...	7	0	0
13	Kajum Ali, ...	1 Ditto.	Senior Scholar at the Roorkee College,.	0	0	0
14	Abdoor Ruzak, ..	1 Ditto.	Ditto ditto, ...	0	0	0
15	Sheopershad, ..	1 Ditto.	Ditto ditto, ...	0	0	0

The following remarks of the Principal on some defects in the system of education formerly pursued in this College (and indeed in all the Colleges), which he is attempting to rectify, will be read with interest.

There are two fundamentally different systems of education. One is to allow and encourage a boy to pay particular attention, and almost exclusively devote himself, to those branches of study to which he seems to have a natural bias, or in favour of which he may have acquired a prejudice. The other is to attempt the general development of the faculties, and to store the mind with general knowledge. Both systems have their advocates, and both are excellent in their proper place. The former system is best adapted for a University, the latter for a School. To a University a man goes who has already acquired a moderate stock of general knowledge, and if he shows a decided turn for any particular branch, he ought to be encouraged therein. All the

arguments usually urged in favour of a division of labour can be brought to support it, but it is a different case with us. The educational establishments of this country, by whatever name they may chance to be dignified, are as yet but schools, and scholars ought not to be allowed to read and paraphrase Shakespeare and Bacon before they understand thoroughly the first six Books of Euclid, nor ought they, on the other hand, to be permitted to penetrate the mysteries of the Differential Calculus and Astronomy before they can understand a plain piece of English (I am speaking of course of the English Department). Now I fear that what I call the University system of education has been hitherto too much followed in this College. Of course I do not wish to attribute the slightest blame to those gentlemen, who previously to myself have superintended the Dehlie Institution; I acknowledge mine inferiority both in general and particular attainments, but I think the system, they pursued, may have been somewhat faulty. The system however was common to all the Institutions of India till within the last few years, and I believe is in accordance with the spirit of the Instructions issued for the guidance of Colleges by the General Committee of Public Instruction, Fort William, 1841, who in fact were the authors of the evil, if evil it were, under this system. Mathematics were in danger of being neglected, whereas I think that in our educational Institutions science ought not for a moment to be neglected, inasmuch as it would appear to me to be the most powerful instrument to rouse the native mind from the apathy and torpor in which it is at present sunk, and to make the pupils think. In fact many of our pupils scarcely think at all. They will get up a fair amount of History and Literature, as much as the memory can well be loaded with: they will remember a very considerable share of what they read and hear; but set them down to a Mathematical problem, which they have not before seen, and many of them will, after half an hour's looking at the four corners and the two sides of the paper, rise up without having made an effort at all; this ought, if possible, to be corrected. If not stopped at the outset, it frequently becomes incorrigible. In nine out of ten instances, the aversion to Mathematics, which appears to be inherent, is acquired. To make this plain, I will suppose the case of a boy in the sixth English class. In his Poetical Reader, he hears the meaning of every difficult word from his master, and he immediately writes that meaning over the word in his book, and by dint of reading over and over, commits it to memory. In his history, he remembers every date, and in his Geography the name of every chief town. But in his Arithmetic, he entirely fails. Well—after the examination, on summing up his numbers, he appears to have acquitted himself, on the whole, creditably. He obtains promotion to the fifth class, and he is there supposed to read higher Arithmetic, and perhaps a little Algebra and Geometry, for which he is entirely unprepared. And then, knowing that he is unable to compete with his class-fellows in science, he is in a measure compelled to devote his whole energies to the other subjects, in order to take a good general place at the end of

the year. A similar course is pursued throughout the succeeding years; and thus the boy may mount up to the first class before he is able to do a moderately difficult question in the Double Rule of Three. Now, supposing such an instance to have occurred, what is to be done? A boy in the first Literature class, can scarcely be transferred to a very low Mathematical class, and the case must be borne with, till a remedy can be applied gradually in time. This very year, Bisshun Nath, one of our best pupils in Literature, has acquitted himself worse than indifferently in Mathematics; and in 1852 will read in the third Mathematical class, and might, with advantage to himself, be transferred to a lower Mathematical class, if the arrangements for carrying on the duties of the College admitted thereof. Nearly the same observations apply to the Oriental College, but here the difficulties to be contended against, are greater on account of the great disparity of the acquirements of the boys when they first enter. Many enter with a fair amount of Persian, or Arabic reading, but without the slightest acquainance with Science, and there appears to be but slight prospect of our speedily being able to classify them with respect to general attainments, *i. e.* to have the first Arabic and the first Persian class, constitute also the first Mathematical class, &c.

The annual examination began on the 15th of November, and ended on the 23rd of December 1851. The Principal gives the following account of the proceedings. .

During this interval every class, beginning from the lowest, was most carefully examined, in every subject they had studied throughout the year by Mr. Taylor and myself; sometimes taking different subjects, and sometimes both giving our opinions on the same subject. Dr. Ross lent us considerable assistance in attending the examinations six or seven times, and on one or two occasions taking part therein.

For the first English class, questions on all the subjects of study for the year, and which are noted in the margin,* were received from Government, with the single exception of Warren's Selections from Blackstone, the questions in which were prepared on the spot. With respect to the Literature, I think this class, which was taught in these subjects by Mr. Taylor, may be said to have acquitted itself very creditably. In the Midsummer Night's Dream, the highest numbers awarded, were 41, 39, 38, 36, &c. In the Essay on Criticism, 46, 44, 40, 36, &c. In Bacon's Advancement of Learning, 47, 45, 36, 30, &c., and in Warren's Selections from Blackstone, 42, 42, 36, 35, &c. In the Absalom and Achitophel, the answers awarded, were 34, 29, 29, 28, &c., but perhaps the

* Midsummer Night's Dream.
Dryden's Absalom and Achitophel.
Bacon's Advancement of Learning.
Pope's Essay on Criticism.
Elphinstone's History of India.
Keightley's History of England.
Geometry.
Algebra.
Plane Trigonometry.
Conic Sections.

questions in that subject were rather more difficult than ordinary. While the examination in Bacon was going on, Mr. Assistant Secretary Sherer visited the College, and I requested his opinion on the answers. He did not affix numbers, but his general opinion was couched in the following terms: "I think Bishun Nath has done best and next to him Juddoo Nath; but the latter, although his answers are very full, has a little jumbled up different parts in his mind. Both of these sets of answers display, what is so much more valuable than mere mechanical reading, however well recollected, exertion of thought on the subject which has been studied."

In the History of India, which I myself taught, but which Mr. Taylor examined, the numbers awarded, are 46, 43, 37, 36, &c. In the History of England, for which I am likewise responsible, both as to the teaching and the examination of the answers, the performance was by no means so creditable, the numbers awarded being 35, 34, 34, 27, &c. In fact our pupils do not yet appear to have any clear conceptions of English History, and especially of the constitutional struggles that were going forward throughout the period under study during the past year; besides, the historical questions laid before them were rather full and difficult.

In Geometry, which included many difficult original problems, the numbers were 42, 28, 26, 23, &c. In Algebra 38, 35, 20, 17, &c. In Trigonometry 30, 17, 13, &c.; in fact, the examination in this subject may be pronounced a failure. In Conic Sections 30, 19, 17. These numbers are given with reference to the questions forwarded by Government, many of which were very difficult. I do not say however *too* difficult, as I believe, had some of our old pupils remained they would have answered nearly all, and I trust we shall be in a position to make light of similar difficulties next year.

Sir Theophilus Metcalfe, with his usual liberality, having placed at the disposal of the Local Committee a valuable silver medal for the best Essay on the British period of the History of India, and having requested Mr. Gubbins to be good enough to undertake the examination, that gentleman pronounced the Essay of Ameer Ali, of the first class, to be the best, and that of Bishen Nath, of the same class, to be the second best. I requested Mr. Gubbins' opinion on the Essays in general, and it was given as follows. "I fear I am rather a harsh judge of Essays, as my standard is somewhat high, but as you wish my opinion, I must say that I thought them for the most part mediocre. The two I retained at last were decidedly superior to the rest, and the English of the beginning of the one I selected, really good. But as a general rule, they are too fond of learning extracts by heart, and writing them out *verbatim*, thence the good parts in most of them are exactly alike, and they scarcely think at all."

For the Arabic Department papers from Government were received in the subjects named in the margin.* The papers on the other subjects, as well as the papers of questions in Persian, were prepared on the spot. The answers in Literature were examined by Moulvee Syud Mohomed, assisted by Moulvee Sobhan Buksh, and afterwards forwarded to Mufti Sudder-ood-deen Khan, for his opinion. The answers in Science were examined by myself and Mr. Taylor, with the assistance of Masters Ram Chundra, Radha Kishen, Kurreem Buksh, and Zakaoolla. The plan was this; all the higher papers were read over either to Mr. Taylor or myself, and perhaps nearly as accurate an award made as if they had been written in English. In the Literature, it is the opinion of the Moulvees that Nuzzeer Ahmud, of the first Arabic class, and Dhurnedhur, of the first Persian, have passed a very good examination. In Science the answers of Sheikh Zeeaooddeen, of the first Arabic class, were very fair, as were likewise those of Bubbur Ali, a student of the first Persian class in Literature, but only in the second class in Mathematics.

* Tareekh Yamani.
Dur al Mukhtar,
Humasa.
Soolum.

For the Sanscrit Department, papers of questions were received from the Government in the subjects noted in the margin,* and were issued to the sole pupil that had been studying these subjects throughout the year. Questions had also been received in Manoarma, but these were not issued, as the sole pupil, Gunga Ballub, that had been studying this subject left us during the year. The Sanscrit Department at the present time contains no advanced pupil with the exception of Purus Ram; but as we have lately had an infusion of young blood, it is to be hoped that this state of things will not long continue. The second class numbers several young and promising pupils; among whom I would particularly mention Besheshur, Ramsookh, and Ram Jeevun. The examinations in this Department were conducted in a manner exactly similar to that of the Arabic Department.

* Siddhant Kaumadí.
Bhulti Rao.
Amurkosh.

The Medal of Mufti Sudder-ood-deen Khan, who continues to manifest such a praiseworthy interest in the cause of education, for the best Urdu Essay on the following subject: "What should a King do to give stability to his government, and to preserve order in the affairs of State," was awarded to Alee Ahmud, of the first Arabic class, the Mufti himself having been so good as to examine the Essays of the different competitors.

With respect to the second English class, with the exceptions of the subject of Algebra and of the Translation from Urdu into English, the examination ought, I think, to be pronounced highly satisfactory. The answers in Literature, History, and Political Economy, reflect great credit on Mr. Roberts who taught these subjects; their Geometry likewise may be pronounced good; and I trust I shall not have to record a failure in their Algebra next year, as the class is composed of young

and intelligent pupils: I would wish to direct attention particularly to the performances of Ramjus, who was good in all subjects, and who I think has fairly earned promotion to a higher class. The usual tabular statement of results will accompany this and the other classes.

The examination of the 3rd class may also, I think, with some exceptions, be pronounced satisfactory. The Prose Reader and part of the Poetical Readers of this class were taught by Mr. Roberts with his usual success, nor has Mr. Stewart this year been unsuccessful in imparting instruction, and his zeal and diligence merit much praise. Indeed, on this account, it would be invidious to single out any individual, as every officer about the College has been most assiduous and diligent in the discharge of his duties.

The Principal does not go *seriatim* through the examination of the lowest classes, but an inspection of the Tabular statement forwarded with his report, appears to show that very fair average marks were obtained by all, and as in no instance do the remarks appended draw attention to any deficiency, we may conclude that the results on the whole were quite satisfactory.

The following extracts from the Report may further be added:

During the past year, Master Radha Kishen, with some slight assistance from Master Ram Chunder, has completed the translation of Young's Mechanics, Masters Ram Chunder and Kurreem Buksh have brought out a revised and improved edition of the Algebra in general use in the Oriental Seminaries of the North West. At present Master Ram Chunder is engaged in the translation of a manual of Surveying for the Roorkee College; and Master Hosainee in the translation of a medical work for Dr. Elderton, Civil Surgeon of Meerut.

The Surveying class throughout the year was attended by 31 students, from the English Department, and 8 from the Oriental. The drawing class comprised 42 pupils, including 15 of those who also were in attendance on the surveying class.

Out-door Scholarships.

As in the preceding years, notices of the examination of out-door candidates were forwarded by the Local Committee to the Commissioners of Dehlie, Meerut, and Bareilly with the request that they would disseminate them as widely as possible. On the day appointed, four Arabic and four Persian candidates presented themselves for examination, and of these two Arabic and two Persian were found duly qualified. Two Sanscrit pupils likewise presented themselves, but they were found to have no knowledge of Arithmetic or Geometry, and of course could not, according to the rules, succeed; they were consequently rejected.

List of Senior and Junior Scholarships of the Dehlie College, for the year 1852.

Names.	Amount of Salary.	Total of each Department.	Grand Total.
English Department.			
Senior Scholars.			
Dwarka Nath,	25 0 0		
Juddoo Nath,	25 0 0		
Ameer Ali,	25 0 0		
Bisshun Nath,	22 0 0		
Doorga Pershad,	18 0 0		
Nund Kishore,	18 0 0		
Raja Lall,	18 0 0		
Bhugwan Dass,	12 0 0		
Elahee Buksh,	9 0 0		
Sut Cowrie,	9 0 0		
		181 0 0	
Junior Scholars.			
Ramjus,	8 0 0		
Sheo Narain,	8 0 0		
Rujjoo Mull,	7 0 0		
Kishen Lall,	7 0 0		
Peearee Mohun,	7 0 0		
Buldeo Sahae,	6 0 0		
Noor Mohumed,	6 0 0		
Sree Nath,	6 0 0		
Goorsaha,	6 0 0		
Banarsee Dass,	5 0 0		
Oomrao Singh,	5 0 0		
Hurdeo Sahae,	5 0 0		
J. Derimo,	5 0 0		
W. Vyal,	5 0 0		
Manohur Lall,	5 0 0		
Tara Chund,	4 0 0		
Kunhia Lall 1st,	4 0 0		
Pran Kishun,	4 0 0		
Ram Chunder 1st,	4 0 0		
Ummur Nath,	4 0 0		
Ram Chunder 2nd,	4 0 0		
Fukeer Chund,	4 0 0		
Nanuck Chund,	4 0 0		
Bishumbher, son of Moolchund,	4 0 0		
Gopaul Singh,	4 0 0		
Sher Singh,	4 0 0		
W. Staines,	4 0 0		
Abdoolla,	4 0 0		
		143 0 0	
Carried over,	.. .. ..	324 0 0	

Names.	Amount of Salary.	Total of each Department.	Grand Total.
Brought forward, ..	.. .. ..	324 0 0	
Nuvul Singh, ...	4 0 0		
Chundoo Lall, ...	4 0 0		
Hoossainee, ...	4 0 0		
Goor Pershad, ...	4 0 0		
Peeara Lall, son of Ram Narain, ...	4 0 0		
Venaick, ...	4 0 0		
Wuzeer Ali, ...	4 0 0		
Kunhia Lall, 2nd, ...	4 0 0		
Shunker Dass, ...	4 0 0		
Gungapershad, son of Bhowani Dass, ..	4 0 0		
Bisshun Nath, son of Ram Nath, ...	4 0 0		
Atma Ram, ...	4 0 0		
Sheojee Ram, ...	4 0 0		
		52 0 0	376 0 0
Arabic Department.			
Senior Scholars.			
Khaja Zeesooddeen, ...	12 0 0		
Ali Ahmud, ...	12 0 0		
Nuzeer Ahmud, ...	12 0 0		
Sheikh Zeeaooddeen, ...	12 0 0		
Tafazool Hoosain, ...	12 0 0		
Mahommed Yakoob, ...	10 0 0		
Mahommed Hoosain, ...	9 0 0		
Seerajooddeen, ...	9 0 0		
Rahim Buksh, ...	9 0 0		
Fuzla Ruhman, ...	9 0 0		
Gholam Koodsee, ...	9 0 0		
Abdoolla, ...	9 0 0		
Hoosaine Buksh, ...	9 0 0		
Ali Nukee, ...	9 0 0		
Mahommed Mirza, ...	9 0 0		
Alumdar Hoosain, ...	9 0 0		
		160 0 0	
Junior Scholars.			
Oolfut Hoosain, ...	7 0 0		
Lateef Hoosain, ...	6 0 0		
Noorul Hoosain, ...	6 0 0		
Ahmud Hoosain, ...	5 0 0		
Syed Ahmud, ...	4 0 0		
Sadik Ali, ...	4 0 0		
		32 0 0	
Carried over, ...	.. .. ..	192 0 0	376 0 0

Names.	Amount of Salary.	Total of each Department.	Grand Total.
Brought forward, ..	.. .. ..	192 0 2	376 0 0
Persian Department.			
Senior Scholars.			
Dhurmdhur, ...	9 0 0		
Bubur Ali, ...	9 0 0		
Dilsher Khan, ...	9 0 0		
		27 0 0	
Junior Scholars.			
Mohumed Beg, ...	7 0 0		
Abdool Ghunee, ...	4 0 0		
Sulleemoollah, ...	4 0 0		
Umur Nath, ...	4 0 0		
Buddree Nath, ...	4 0 0		
Ali Hoosain, ...	4 0 0		
Ali Buksh, ...	4 0 0		
Nadir Hoosain, ...	4 0 0		
Jankee, ...	4 0 0		
		39 0 0	
Sanscrit Department.			
Junior Scholars.			
Purs Ram, ...	5 0 0		
Ram Sookh, ...	4 0 0		
Munohur, ...	4 0 0		
Hurna, ...	4 0 0		
Bashashur Nath, ...	4 0 0		
Ram Jeewun, ...	4 0 0		
Kidara, ...	4 0 0		
Ruggoo Nath, ...	4 0 0		
Gowree Shunker, ...	4 0 0		
		37 0 0	
Out-door Candidates.			
Arabic Department.			
Nusseerooddeen, ...	4 0 0		
Abdoolla, ...	4 0 0		
		8 0 0	
Persian Department.			
Surfurraz Ali, ...	4 0 0		
Khaja Ahmed, ...	4 0 0		
		8 0 0	311 0 0
Total Company's Rupees..	.. .. ..	.. .. ..	687 0 0

A sentence from an earlier part of the report seems to form a fitting conclusion to this notice.

In speaking of what has been accomplished by the labours of the last year, it cannot, I fear, be said that any splendid results have been obtained. We have produced no first-rate scholar; the number of pupils has not received a large augmentation, nor does the desire for English education appear to have greatly increased. Yet, notwithstanding, I trust that it will appear from the statistics furnished, as well as from the answers given in at the general examination, that the year has been usefully spent; that there is every reason to entertain hope for the future, and that at present we have in training those who in a year or two will prove far from contemptible scholars.

BENARES COLLEGE.

60TH YEAR.

RETURN OF THE LOCAL COMMITTEE AS ON THE 30TH APRIL 1852.

NAME.	DESIGNATION.
E. A. Reade, Esq., President, --	Commissioner.
A. Shank, Esq., -- -- -- --	Civil and Sessions Judge.
F. B. Gubbins, Esq., -- -- --	Collector and Magistrate.
Major W. Stewart, -- -- -- --	Agent, Governor General.
Dr. D. Butter, -- -- -- --	Post Master.
James G. Gordon, Esq., -- -- --	Merchant.
Maharaja Iswari Prasad.	
Narayana Singh Buhadoor, -- --	Rajah of Benares.
Raja Sathya Charan Ghosal.	
Babu Rajendra Mittra.	
Babu Ramprasan Singh.	
James R. Ballantyne, Esq., L.L.D.	Secretary L. C. P. I.

No changes appear to have taken place during the year in the establishment of this Institution, further than that the serious and continued illness of Mr. Nicolls, the Head Master, rendered it necessary for the charge of his duties to be entrusted to another. In obedience to the instructions of the Principal, therefore, Mr. Tresham assumed the superintendence of the Junior Department from the month of June. The following returns will afford full information as to the status of the College on 30th April 1852.

Establishment of the English Department of the Benares College, as on the 30th April 1852.

Names.	Designation.	Amount of Salary.	Date of Appointment.
		Rs. A. P.	
J.R. Ballantyne, Esq., L.L.D.,	Principal, ...	600 0 0	3rd Jany. 1846.
G. Nicholls, Esq., ...	Head Master, ...	400 0 0	1st July 1834.
D. Tresham, Esq.,*	Second Master, ..	200 0 0	5th Sept. 1840.
Babu Mathuraprasada Misra,†	(Offg.) 3rd Ditto,	150 0 0	17th April 1847.
Babu Shiva Shankara Singh, ..	Fourth Ditto, ...	100 0 0	9th March 1842.
Babu Kedarnath Paludhi, ..	5th Ditto, ...	50 0 0	21st May 1846.
(Office Vacant), ...	6th Ditto, ...	50 0 0	
Babu Amarnath Mittra, ...	Librarian, ...	30 0 0	1st July 1848.
Babu Prankrishan Ghose, ..	Writing Master, ..	20 0 0	11th July 1848.
Moulvee Jalalooddin, ...	1st Urdu Teacher, ..	50 0 0	7th Nov. 1847.
Munshi Jagannath Das, ...	2nd Ditto, ...	25 0 0	7th April 1845.
Pandit Badri Lal, ...	1st Hindi Ditto, .	50 0 0	1st October 1838.
Pandit Lokenath Chaubè, ..	2nd Ditto, ...	25 0 0	17th April 1847.
Pandit Ramajasana, ...	Anglo-Sanscrit ditto.	30 0 0	1st March 1849.
	1 Water Bearer, ..	5 0 0	
	1 Farash, ...	4 0 0	
	2 Chowkidars, @ 4 ea	8 0 0	
	2 Peons, @ 4 each, ..	8 0 0	
	1 Duftari, ...	5 0 0	
	1 Sweeper, ...	3 0 0	
House-rent of Dr. Ballantyne,	Principal, ...	50 0 0	5th April 1845.
Ditto ditto of Mr. Nicholls, ..	Head Master, ...	50 0 0	27th Jany. 1844.
Bhagavana Das, ...	Supy. Hindi Teacher,	10 0 0	18th Sept. 1844.
Moulvee Adul Ali, ...	Supy. Persian ditto, .	25 0 0	1st April 1849.
F. E. Hall, Esq., M. A., ..	Coadjutor to the Principal, ..	300 0 0	18th Feby. 1850.
Mr. Benj. Concannon, ...	Supy. Eng. Teacher,	75 0 0	1st Jany. 1851.

* Previous service dating from 12th September 1833, when appointed 2nd Teacher in the late Allahabad School.

† Drawing half Salary.

Establishment of the Sanscrit Department of the Benares College, on the 30th April 1852.

Names.	Designation.	Amount of Salary.	Date of Appointment.
		Rs. A. P.	
Iswara Datta Pandé, ...	Assistant Secretary, ..	50 0 0	27th Dec. 1842.
Narayana Sastri, ...	1st Grammar, ...	60 0 0	1st May 1833.
Deva Datta, ...	2nd Grammar, ...	32 0 0	Ditto ditto.
Durga Datta, ...	3rd Grammar, ...	30 0 0	1st Sept. 1842.
Hiranund Chaubè, ...	Poetry, ...	80 0 0	1st June 1827.
Umarama Pandit, ...	Vedanta, ...	80 0 0	1st February 1825.
Kaliprasada Bhattacharjya, ..	Logic, ...	80 0 0	2nd April 1847.
Kashi Nath Sastri, ...	Sankhya, ...	80 0 0	5th Dec. 1837.
Gulzar Chaubè, ...	Law, ...	80 0 0	5th Dec. 1837.
Lujjashankara Pandit, ...	1st Astronomy, ..	80 0 0	1st Feb. 1835.
Nunda Lall Pandit, ...	2nd Ditto, ...	32 0 0	1st Feb. 1835.
Bapu Deva Sastri, ...	Natural Philosophy, .	80 0 0	15th Feb. 1842.
Maulavi Mahomed Ahsan, ..	1st Arabic Teacher, ..	82 0 0	4th Nov. 1847.
Munshi Vishesharprasada, ..	2nd Persian Teacher, .	20 0 0	1st October 1841.
Jadu Nath Pandit, ...	Librarian, ...	50 0 0	1st May 1820.
Radanath Chuckerbutty, ..	English Writer, ..	32 0 0	1st Feb. 1851.
Kanahya Lal, ...	Hindi ditto, ...	8 0 0	15th January 1842.
Haro Datta, ...	Duftri, ...	8 0 0	1st October 1829.
Ramajeana, ...	Jamadar, ...	7 0 0	20th April 1850.
	3 Peons, @ 4 each, ..	12 0 0	
	2 Farashes, ...	5 0 0	
	2 Water Bearers, ..	8 0 0	
	2 Bell Strikers, ..	5 0 0	
	1 Sweeper, ...	2 0 0	
	House-rent, ...	25 0 0	
Gopal Bhatta, ...	Pensioner, . ..	20 0 0	

Statement of the Number, Caste, &c. of the Students of the Benares College, as on the 30th April 1852.

Statement showing the number of Students paying, and the amount paid by them, and Students who do not pay; as also the amount of Entrance Fees on the 30th April 1852.				*Statement showing the number of Students studying each of the languages taught, on 30th April 1852.*						*Statement showing the number of Students on the 30th April 1852.*			
Non-paying.	Paying and amount realized during the year, deducting the expense of collection.	Amount of Entrance Fees realized during the year.	Total.	English.	Arabic.	Persian.	Oordoo.	Sanscrit.	Hindee.	Christians.	Mahomedans.	Hindoos.	Other than these three.
	63 at 1 Re. each. 48 at 8 As. each.									5	18	319	
*231	111 Paying pupils ——— Rs. A. P. 789-11-11	Rs. A. P. 0 0 0	Rs. A. P. 789 11 11	222	8	57	117	103	103	Total -- 342			

* Including Scholarship-holders in the various Departments of the College.

Statement exhibiting the Number and Names of Students of the several Departments of the Benares College, who have obtained employments from the 1st May 1851 to the 30th April 1852.

No.	*Names.*	*Age.*	*Date of Admission.*	*No. of Years in the Institution.*	*Names of Employments.*	*Salary.*
1	Kedar Nath Banerjya, --	16	November 1846, -- --	4 Years and 6 months, -	Teacher, -- -- -- --	15 0 0
2	Durga Dass Banerjya, --	16	January 1848, -- --	3 Years and 7 months, --	Writer, -- -- -- --	30 0 0
3	Dayarama, - -- --	16	March 1850, -- --	1 Year, -- -- -- --	Clerk to the Wakeel, -- --	10 0 0
4	Srikantha Bhattacharye,	20	January 1844, -- --	7 Years, -- -- -- --	Writer, -- -- -- --	12 0 0
5	Kessan Sahai, -- --	16	February 1850, -- --	1 Year and 6 months, --	Daroga, -- -- -- --	7 0 0
6	Jaygopal Mukerjya, --	17	March 1818, -- --	3 Years and 6 months, --	Writer, -- -- -- --	20 0 0
7	Gyan Chander Rai, --	17	January 1844, -- --	7 Years and 8 months, --	Writer, - -- -- --	50 0 0
8	Hara Prasad, -- -- --	10	July 1851, -- -- --	4 Months, -- -- -- --	Chobdar, -- -- -- --	5 0 0
9	Dasu Prasad, -- -- --	22	November 1841, -- --	9 Years and 7 months. --	Writer, -- -- -- --	20 0 0

Statement of Receipts and Disbursements of the Benares College, during the official year 1851-52.

| Resources of Income. | | |

The examination commenced on the 11th of December, and concluded on the 26th of the same month.

Of the Senior class, English Department, the Principal reports: Of the three youths in this class, Rama Chunder Sen having considerably outstripped his competitors, has been ranked first. All three of them are intelligent and amiable lads. My reading with them during the session has embraced the play of "Othello," a book of the Paradise Lost, the first two parts of Whately's Rhetoric, something of Abercrombie's intellectual powers, and portions of my Exposition of the Nyaya Philosophy. These three lads expressed a desire to see a little of Surgery, and acquire the Rudiments of Anatomy and Medicine, and Dr. Leckie, the Civil Surgeon, obligingly consented to give them some instruction in these subjects.

The difficulty of obtaining employment after leaving College having been much felt at the Benares Institution, (though this is not the case at the others), the Principal proposed the question as a subject for the Essay, with a view of eliciting the views of his pupils as to their own prospects. Though all of them seemed to be under the mistaken impression that the express object of the College was to train for public employment, and that so far as that was not provided, the students had fair ground for disappointment, still the Essays showed a good deal of thought, and in one especially, that of Ram Kali, it was highly gratifying to observe the proper and moral aim of education distinctly recognized. The Principal observes,

Of the Junior scholarshipholders this year Ganésá, Chaube, stands much above his fellows. I concur with the Head Master in proposing that he have a vacant senior scholarship.

Of the Translations from English into Oordoo none was of such a character as to deserve for itself the moiety of the Ghosal scholarship now vacated by Bireshwar, who has left the College. As however, the writer of one of the best among the Translations, viz., Harjan Das, has carefully studied in Oordoo, Dr. Mouat's large work on Anatomy, and as it is desirable to encourage such studies as that of Medicine, I propose to award the vacant moiety of the Ghosal scholarship to him, on the ground of his having turned his knowledge of Oordoo (as compared with the other competitors) to the best practical account.

Scholarships in the English Department of the Benares College, for 1852.

Names.	Age.	No. of Marks.	Amount of Scholarships.	Remarks.
Senior Scholarships.				
Gobind Chandra Sandel, ..	22	Studying law.	20	
Ram Kali Chandahri, ..	21		20	
Ram Chandra Sen Gupt, ..	16	81	18	Increase of 2 Rupees.
Kashiprasada Chaturjya, ..	18	40	16	
Chandra Nath Mittra, ..	18	59	16	Decrease of 2 Rupees.
Ganesa Chaube, ...	18	63	16	Promoted to the 1st class, and to a Senior Scholarship from the 2nd class, and a Junior Scholarship.
Junior Scholarships.				
Grishchandra Sandel, ...	17	44	10	Retains his Scholarship.
Sita Nath Mittra, ...	17	59	10	Ditto ditto.
Kailasnatha Sukula, ...	15	59	10	Promoted fromthe 3rd class to the 2nd class, and obtained Junior Scholarships.
Kesava Chandra Mittra, ..	15	41	8	
Sarata Chundra Mukurjya, ..	15	55	8	
Nabina Chandra Banurjya, ..	14	48	8	
Ghosal Scholarships.				
Surja Kanta Chaturjya, ..	16	42	8	Retains his Scholarship.
Harjana Dass, ...	17	40	8	In room of Bireshwara Bhattacharjya whose term for holding the scholarship expires, and who has left College.

Of the Arabic and Persian Departments it is remarked,

The written examination of the Senior pupils in this Department was founded on questions sent down from Government. The younger boys, who did not undergo the written examination, I examined orally. To several promising young boys, I have assigned small prizes.

The following is the proposed assignment of the Scholarships in the Arabic and Persian Departments of the Benares College for 1852.

Names.	Age.	No of Marks.	Amount of Scholarship.	Remarks.
Senior Arabic Scholarships.				
Vazir Ali, ...	20	157	14	Recommended for 1st Senior Scholarship.
Mahammad Raza, ...	19	141	10	Increase of Rs. 2, taken from the vacant stipend to which Vazir Ali is promoted.
Junior Arabic Scholarships.				
Abbas Samad, ...	17	145	8	Retains his Scholarship.
Senior Persian Scholarships.				
Audh Behari Lal, ...	14	166	8	Increase of 2 Rupees.
Bechu Singh, ...	19	160	7	Decrease of 1 rupee each, having been surpassed by Audh Behari Lall.
Krishna Chandra, ...	20	157	6	
Junior Persian Scholarships.				
Nanda Kishore, ...	16	161	6	Increase of 1 Rupee.
Sajed Ali, ...	15	157	6	Ditto ditto.
Mohan Lal, ...	18	132	5	Decrease of 1 Rupee each, having been excelled by the two foregoing.
Siva Nandan Singh, ...	18	130	5	

As the Sanscrit Department naturally introduces the subject of those particular labours with the Pundits for which this Institution is distinguished, it will be expected that considerable space should be devoted to an account of what is being effected in that direction. The following extracts from the report will, it is thought, be perused with great interest.

Report on the Mathematical classes of the Sanscrit Department by Pundit *Bapu Deva.*

"This year (1851) I have had under my tuition 28 boys, form-"ing four distinct classes.

"In the 1st class, there are three pupils viz., Bala Krishna, "Govind Deva and Rama Narayana, who have read part of Hall's

"Differential Calculus and of Bhaskara Acharya's Ganitadhyaya, to the "latter of which they have devoted more of their attention than to "the former. In the second class, there are twelve boys, viz., Tara "Datta, Shyama Tiwari, Kashi Nattha Dube, Viswa Nattha Dube, "Rama Dina Purohita, Veni Sankara, Bhairama Jagannatha Pande, "Suvansa Chaube, Sitala Prasada, Narayana Datta Pantha, and Rama "Sarana Pande. They have read the first 272 pages of my Hindee "Algebra, including Simple Equations. Though they have made con- "siderable progress, yet they are not very ready in solving extremely "difficult problems. The class, generally, consists of bright and "intelligent youths, of whom Tara Datta, Shyama Tiwari, Kashi "Natha Dube, and Viswa Natha Dube, deserve particular notice for "their exertions and their intelligence.

"I regret that Sitab Prasada, the first senior Scholar in the Col- "lege, is not more attentive to Mathematics, in which he is qualified "to excel if he were to apply diligently.

"The third class consists of five boys, viz., Ganesa Sastri, Ganga "Prasada Tiwari, Rama Krishna Bhatta, Bhuballabha Pande, Dur- "bali Tiwari, Rama Govinda, Makanda Prasada Dube, and Veni San- "kara Upadhyaya. They have read the first 36 pages of my Sans- "crit Arithmetic. Ganesa Sastri is tolerably acquainted with Nyaya, "&c. and judging from the amount of intelligence, perseverance, and "zeal which he has evinced during the short time he has been at "the study of Mathematics, I think he will soon do credit to himself. "His continuance in the College for some years is highly desirable, "and to that view, I should rejoice if a Scholarship of the lowest "grade were granted to him.

"I feel confident that if the boys of the second class shall con- "tinue their Mathematical studies in the way they are now conduct- "ing them, they will make excellent progress in Mathematics. After "they shall have gone through a course of the Elements of Geometry, "and Plane and Spherical Trigonometry, I intend to take them back "to the Siddhanta Siromani, with a view to their understanding its "topics in a way that they could not formerly do. For Bhaskara "Acharya says, the (celestial) globe is a figure which is capable of "being well understood by the intelligent with the aid of computa- "tions, but, in reality, there does not exist any work in Sanscrit which "gives such information about the globe as is to be obtained from "Spherical Trigonometry. Therefore, after having read Geometry "and Trigonometry, the students will understand the Siddhanta in a "superior manner, and also those computations in it, of which no de- "monstrations are given, and which cannot be demonstrated without "admitting that the earth moves and the sun is stationary, a doctrine "of which just the reverse is taught in the Siddhanta. Their delusion

"in regard to the motion of the earth will thus vanish, since in order to "apply the improved computations they will be compelled to admit "that the earth moves and the sun is motionless.

"As my Hindee Algebra has been printed under the patronage "of the Government, so when under its auspices, my Sanscrit or Hin-"dee Treatises on Geometry, Trigonometry, Analytical Geometry, "Conic Sections, Mechanics, Differential and Integral Calculus and "Astronomy shall be printed, they will afford great facilities in teach-"ing the exact sciences. I have just received copies of my version of "Euclid, (Book I.), the want of which has much impeded us. My "Sanscrit works on Trigonometry and the calculation of the Solar "and Lunar Eclipses, according to the European mode, are ready for "publication."

The Philosophical Department of the Sanscrit College.

Last year, I was glad to be able to record the intelligent zeal with which the Nyaya Pundit Kali Prasada Bhattacharya, has mastered the outlines of the Aristotelian Logic, and communicated a knowledge of them to his pupils. This year the sphere of his usefulness has been extended, and it may be briefly explained why his may now be advantageously regarded as the Philosophical, instead of merely the Logical Department of the Sanscrit College.

Having undertaken, for reasons stated in the Advertisement to the Synopsis of Science, to recast the Sanscrit Lectures on the mutual relations of knowledge in the mould of the Nyaya Philosophy, the Nyaya Professor was the man whom I first looked to as the person to aid me in expounding my views to the students. He did not fail me; and the earnest and apparently most unaffected interest with which he has exerted himself to master and to communicate the views, so novel to him, on matter and motion, Astronomy, Physical Geography, Optics, &c., has been to me very gratifying.

I aim at making this professional chair the nucleus and centre of the whole Sanscrit Department. The separate divisions are not in future, if we can prevent it, to look on one another as separated by a barrier across which it may suffice if the civility of a bowing acquaintance be kept up. This chair of what, in Bacon's phrase, may be termed the Philosophia Prima, that Philosophy which treats of whatever like a common trunk, belongs to all the sciences before they branch off in their several radiations, may be made a most effective instrument for here breaking up the too prevailing narrowness of view, and for bringing the conjoint instead of the conflicting illustrations of each phasis of truth to bear on whatever subject may be in hand. But the Professor cannot possibly achieve all that I wish, and at the same time

conduct his pupils through the regular Nyaya course, in which I would deprecate the omission of a single treatise. To effect what we aim at, therefore, it would be indispensible to have a joint labourer with him; and there is a pundit who has been trained up in the College, whose services I am most anxious to secure with this view, his qualifications being of such a kind that I should have little hope of soon finding another so well suited for the line of work which I would propose to assign to him.

The Pundit to whom I refer is *Venkat Ram Sastri*. His acquaintance with the Nyaya is unusually extensive and accurate, as I have had abundant opportunity of ascertaining when employing him to make abstracts of a variety of treatises. He is one of the class who read English, and he is now able to relish highly such works as Mill's Logic and Berkeley's Principles. He has been indefatigable in his search after such rare Philosophical works as I have had occasion within the last year to refer to. He is unusually superior to vulgar prejudices, and is both eager in his pursuit of European knowledge, and energetic in his defence of such pursuits when assailed by the more prejudiced. Further, he is a most modest and amiable man; I should wish him to be appointed Assistant Teacher in the Nyaya Department, on a salary half that of the Head teacher, with the understanding that he is particularly to charge himself with assisting the Principal in the preparation of Sanscrit treatises, and in inculcating their contents. As he takes much interest in Chemistry, &c., I should look to him to exhibit experimental illustration to his class in this and other divisions of Physical Science, the mutual relations of which it would be his duty to impress on the minds of his pupils.

There is another service which this Pundit could render, if enabled by a permanent provision to devote his undisturbed attention to the Department in question. I mean the preparation in Sanscrit and Hindee, of convincing and intelligible replies to objectors, whose objections I could then invite with more satisfaction to myself than I can at present. For example, the question of the weight of the atmosphere was recently agitated in some of the native newspapers, the discussion having arisen out of my Commentary on the Tarka Sangraha. The discussion, as it happened, was very well conducted on the right side, by an intelligent writer in the *Sumlah Akhbar*, but an experiment devised by the Rajah of Benares, of weighing a mashak first empty, and then full of air, had a very inauspicious influence on the Philosophic mind here, which we hope to dispel by the aid of an air-pump, which (with the sanction of Government) has been ordered from England. Now it is desirable that we should always have at hand a Pundit competent and ready to explain to every fresh enquirer the cogency of such demonstrations, as we shall then be able to make. The labour is a kind of Sisyphean one, to which I myself, with my other avocations, am not equal. I grudge calling away Bapu

Deva from his Mathematical and Astronomical labours so frequently as I have reason to wish his aid. In fact there is a sphere of duty in the Sanscrit Department, which requires the full forces of a distinct functionary, and I will undertake to qualify Venkat Ram Sastri to deal with it effectively if he be permanently attached to the College, as I trust he will.

Respecting the Hindee Department, Mr. Hall furnished the following statement:

"The portion of this Department, which is instructed by Pundit Rama Jashan, is divided into two classes, containing an aggregate of fifty pupils. Of these, 16 are scholarshipholders. The first class, consisting of 30 boys, have read during the past year the following books: the Buddhi-vidyadyata (all), Putwaree Accounts, Parts II. and III. (all), the Bhugola Vrittanta (all), the Malumat (all), and 20 pages of Bapu Deva's Hindi Geography now publishing. The second class, consisting of 20 boys, have read the Surjapoor-ki-kahani (all), and Putwaree Accounts, Part I. (all). The attendance of Rama Jashan's pupils have been very satisfactory, in view of the little inducement which any, except the scholarshipholders, are supposed by themselves and their parents to have to pursue the study of their despised vernacular."

Of the Pundit class of the Anglo-Sanscrit Department, Mr. Hall reports:

"During the Academic year, this class has read with me about 200 pages of the Calcutta English Reader No. V. This quantity may seem small, but will not appear so if the number of Holidays allowed in the College, and my method of instruction, be taken into consideration. This method is as follows. The pupil reads a sentence of English, and then turns it into Hindi. The drift of the sentence and the topical propriety of every word of it that calls for explanation, are then pointed out. Finally, I express the sentence in English in other words throughout than those in which it is put in the class-book. This style of instruction, though rather laborious, is, I am convinced, the best, under the circumstances, that could be adopted. I now consider my pupils as prepared to read with profit any standard prose work in our language. And it is to be hoped, that no work will be put into their hands whose style will not bear the test of the most rigorous analysis. It is indeed humiliating to see in how merciless and yet unobjectionable a fashion, these superacute, and not hypercritical logicians dissect into sheer absurdity, many modes of thought and expression which we have been taught to regard with unquestioning veneration. Too much pains cannot be taken in the selection of English Literature which we put into the hands of these students during the first years of their present career. It is

all-important that their prepossession with regard to English should be of the most favourable description. These men constitute the very first class of their kind in the history of Indian Education. They are the first among their countrymen that have taken any steps towards qualifying themselves to interpret between the real learning of the East and the learning of Europe. Their influence, direct and indirect, on the learned around them, is much greater than might be expected from an agency numerically so insignificant. It therefore becomes us, as we value their influence on contemporary native scholars, and on their successors in the novel course they are pursuing, to aim at giving the most auspicious direction to the first impressions, and to bring to their notice, in the outset, such things only as most nearly harmonize with such of their established opinions as are obviously unobjectionable.

"Although the progress made in English by the pupils of my class has not been in every case perfectly satisfactory, still each of them may be said to possess peculiar qualifications that can be turned to useful account, with reference to the objects for which this class was established. Pundit Thakura Datta, for instance, though still rather inferior in English, is very serviceable as a translator, and at the same time that he has an excellent knowledge of Sanscrit, he has a real passion for the vernacular, a thing very rare among native scholars. Pundits Rama Narayana and Venkata, have been frequently interrupted in their studies by domestic afflictions and other circumstances beyond their control. I have great hopes of both of them. The zeal and industry manifested by Pundit Govinda Deva fully justify the high rank I have assigned him. But the merits of Pundit Vitthala Sastri call for particular notice. Apart from the ordinary course of reading, in which he has acquitted himself to my entire satisfaction, he has, during the past year, made an excellent translation into Sanscrit of Harris's "Essay on Art," and has done something towards a translation into the same language of Bacon's Novum Organum. He is now studying Latin, so that he may be able to continue his version of this work without being obliged to depend wholly on the English translations of it. I should also mention that he speaks English with considerable fluency and correctness, as does also Pundit Govinda Deva.

"By way of exercise in English Composition, several of my pupils have, from time to time, brought me English translations, made by themselves, from the Sanscrit. These translations I have carefully compared with their originals, and corrected, at least so far as to make them grammatical and passably conformable to our idiom. I have also dwelt particularly on the irreconcilable discrepancies of expression between their classical language and our own tongue. Attention to this point will be of great use to them, in the first instance in enabling them to understand translations which we make

from their own Literature, and in the course of time, in assisting them to make translations themselves, either from English or into it. I have also read with my class, in some instances, in proof sheets, as the works were passing through the Press, a good portion of the translations from the Sanscrit, in course of preparation by Dr. Ballantyne. Among these works have been the old and new editions of the Tarka Sangraha, the Tattwa Samasa, the Nyaya Sutra, Vaiseshika Sutra, Yoga Sutra, Vedanta Sara, and the first Fasciculus of the Sàhitya Darpana. I also went over with them the whole of Dr. Ballantyne's Sanscrit first Lessons before the work was sent to press."

The Report continues—

PROPOSED STUDIES IN THE ANGLO-SANSCRIT CLASS FOR 1852.

At the request of the Pundits themselves, one of the books to be read next year in the class will be Macaulay's History of England, the portion selected being that prescribed by the Calcutta Council of Education to the competitors for Senior scholarships. The duty of conducting the pundits through this portion of their reading will devolve on Mr. Hall. With Mr. Hall, they will also read the first volume of the Synopsis of Science, preparing, as they go along, a simplified version in Hindee for the use of the Hindee Department and of the Vernacular schools. The version will be carefully revised by myself, being transmitted for the approval of the Visitor General of Schools; with Mr. Hall, the Pundits will also read at least a portion of the reprint from Arnott's Physics. If time suffice, they may also read a book of "Paradise Lost."

With the more advanced Pundits of this class, I hope to go carefully this year through the volume of commented extracts (some seventy pages of which have been read during the past session in the proof sheets), from Mill and Whewell, on the Logic of Induction. The subject is so suggestive a one that it will probably lead to a variety of collateral reading.

Another course of reading I at present look forward with much interest to entering upon with the Pundits, the motives for arranging which, as I propose to do, may be here briefly explained. As in the Synopsis of Science, I have claimed the Nyaya system as an ally, insisting upon our title to its services instead of provoking or defying its opposition, so I now seek to press also into the ranks of progress the still more generally revered system of the Vedanta; as my English Text Book, with this view, I take Berkeley's "Principles of Human Knowledge," one of the finest specimens of profound speculation, and of lucid exposition anywhere to be met with. Berkeley, a far more systematic writer than Locke, ought, in my opinion, to be read before Locke's followers of the Scottish school, who so generally and egregiously misconceived Berkeley's system. Waiving dispute as regards

his postulates, the admirable symmetry of his argumentative exposition is peculiarly well calculated to gain the respect of well educated Pundits, and to bespeak a more respectful attention on their part in the sequel to the many valuable considerations interspersed throughout the more loosely and less artistically constructed chapters of Reid, Brown, Stewart, and Campbell, to which my Commentary on Berkeley is so constructed as to be introductory. Although the Nyaya arrangement, as I have had frequent occasion to remark, furnishes a framework for a complete system of Human knowledge, yet it is necessary to bear in mind that the Nyaya is generally valued not as the most highly elaborated exposition of truth; but rather as a scaffolding conducive to more perfect and permanent edification. Whatever, therefore, of truth and soundness may belong to Indian speculation in its ulterior and more recondite forms, it is expedient that we should claim also as our own. The points at which any system of truth begins to branch out into error, are the critical points which it is of all things important to determine, and to deal with. Such a point, for example, I consider to be the question as to the reality of the Phenomena, which I have partly treated in a paper, contributed to the *Benares Magazine* of December 1851, headed, "The Ontology of the Vedanta."

When there is a question of laying down a regular course of reading in Metaphysics and Mental Philosophy, it may be said that the modern European School (under all its varied aspects) dates properly from Locke. But the "Essay on the Human Understanding" is in several respects inconvenient as a class-book, requiring, as it would require, to be read in many parts, under a continued protest, such as Cousin has recorded in his Lectures. In the progress of European speculation, the next stage is that of Berkeley, and his works furnish a convenient starting point, embracing, as they do, in a concise form, the leading results of Locke's enquiry. The transition, through Hume's Vedanta-like scepticism, to the common sense school of later times, requires but a short period of the student's attention, and it is to be expected that these later writings will be studied with greater pleasure, and with a more enlightened appreciation, whether of their merits or of their defects, after a preliminary course connecting or contrasting them, through their more immediate antecedents, with the ancient theories which have survived in India to the present hour.

In Physical Science, carrying on with this class, the preparation of the 2nd volume of the "Synopsis," which brings us to the subject of Chemistry, I shall particularly aim at the construction of a Sanscrit nomenclature, which, so far as my treatment of the problem extends, shall give, (not to the practical chemist or druggist, but) to the enquirer whose language is the Sanscrit, such a methodised apprehension of the science as the nomenclature of Lavoisier and his coadjutors brought within the reach of the liberally educated in

Europe. It is with a view to liberal education, meaning thereby that which prefers light to profit, that I regard Chemistry or any other science in the first instance, being convinced with Bacon, that the precedence of the one to the other is almost as necessary as it is befitting. Our young medical students would engage with all the greater readiness in a study complicated to them as yet with foreign and hence barbarous terminology, if they saw that the learned of their own land appreciated the scientific beauty of a pursuit which must for some time be followed here under repulsive difficulties and discouragements. The discussion of this point in detail, with reference to the practical treatment of this branch of science, ulteriorly will find a more appropriate place in a preliminary advertisement to the proposed treatise than in the present report.

The following three Statements shew the proposed allotment of the scholarships in the Sanscrit, the Anglo-Sanscrit and the Hindi-Sanscrit Departments.

Sanskrit Scholarships for 1852.

NAMES.	*No. of Marks.*	*Amount of Scholarship.*	REMARKS.
SENIOR SCHOLARSHIPS.			
		Rs.	
Tara Datta Jyotishi, ...	197	16	Increase of Rs. 2 from Sitala Prasada Tiwari's Scholarship.
Sitala Prasada Tiwari, ..	180	14	Decrease of Rs. 2, being surpassed by Tara Datta Jyotishi.
Vishwa Nath Dube, ...	164	11	Increase of 1 Re. from Suvansa Choube's Scholarship.
Narayana Datta Panth, ..	160	10	
Suvansa Chaube, ...	154	10	Decrease of 1 Re., being surpassed by Vishwa Nath Dube.
JUNIOR SCHOLARSHIPS.			
Bhai Rama Misra, ...	142	7	
Ganesa Sastri, ...	97	7	Succeeds Ramadina Purohita, who is past the prescribed age.
Kali Charana Pande, ...	91	7	Succeeds Kashi Nath Dube, who is past the prescribed age.
Veni Shankara Vyasa, .	78	7	
Rama Krishna Bhat, .. .	78	7	Succeeds Shyama Tiwari, having past the prescribed age.

Anglo-Sunskrit Scholarships for 1852.

Names.	Amount of Scholarship.	Remarks.
Anglo-Sanskrit Scholarships.	Rs.	
Rama Narayana Sastri,	16	Increase of 1 rupee, taken from vacant stipend.
Bechana Tewari,	16	Ditto ditto.
Venkat Rama Sastri,	16	Ditto, Rs. 2, ditto.
Jagan Nath Sukula,	6	
Jagan Nath Pande,	14	
Bala Krishna Khandakara,	16	
Vithala Sastri,	16	
Govinda Deva Tonkekar,	14	
Vishnu Datta Sukula,	6	
Thakur Datta Misra,	9	
Kashi Nath Dube,	5	These three held Junior Scholarships till now, and no Senior one is vacant,
Shyama Tiwari,	5	
Ramadina Purohita,	5	

Hindee-Sanskrit Scholarships, for 1852.

Names.	Amount of Scholarship.	Remarks.
	Rs.	
Brahma Datta Misra,	2	
Siva Narayana Trivedi,	2	
Sokhu Singh,	2	
Dwaraka Nath Upadhyaya,	2	
Sri Natha Sukula,	2	
Bola Mukunda Sukula,	2	
Rama Chandr,	2	
Ramadasa Sukula,	2	
Sri Rama Sastri,	2	
Ganga Rama Sastri,	2	
Mahesa Prasada Sukula,	2	
Kesava Rama Vyasa,	2	
Bala Deva Vyasa,	2	
Jaya Deva Upadhyaya,	2	
Vindhya Prasada Sukula,	2	
Vinayaka Dube,	2	

The following extracts from Mr. Tresham's Reports, who has been officiating as Head Master, will supply further details as to the working of the College, especially in the Junior Department.

Junior Department.

Commencement of Session 1851.	*Number of Pupils.*	*Close of Session* 1851.	*Number of Pupils.*
First class,	16	First class,	26
Second ditto,	11	Second ditto,	26
Third ditto,	28	Third ditto,	21
Fourth ditto, first section,	20	Fourth ditto,	33
Ditto ditto, second ditto,	19	Fifth ditto,	22
Ditto ditto, third ditto,	17	Sixth ditto,	15
		Seventh ditto,	33
Total,	111	Total,	176

The pupils in the Junior Department have been daily employed, as heretofore, in receiving instruction in the Vernaculars, in connection with English, and the time allotted to each of these two divisions of study extended to four hours for the latter, and two for the former.

The attendance of the pupils in the upper classes of this Department has been, I am happy to report, with but few exceptions, very regular. In the lower classes, the attendance appears to be improving, though not yet so good as could be desired.

The different members of the Committee expressed their entire concurrence in the sentiments of the Principal, and their satisfaction with his report.

BAREILLY COLLEGE.

LIST OF MEMBERS OF THE LOCAL COMMITTEE BAREILLY COLLEGE, THE 30TH APRIL 1852.

NAMES.	DESIGNATION.
F. Williams, Esq., --	Collector.
Major Showers, -- --	72nd Regiment.
H. S. Reid, Esq., --	Visitor General of Schools.
Captain Jones, -- --	Superintendent of Embankments.
Dr. K. Kirk, -- --	Civil Surgeon.
H. Berkely, Esq., --	

At the conclusion of the notice of this Institution, in the printed Report on Public Education in the North Western Provinces for 1850-51, page 79, it was stated that "at a later period of the year (1851), the Bareilly School was erected into a College, and the Superintendent Mr. V. Tregear, was appointed Principal, as it was found that the funds at the disposal of the Government admitted of the measure."

This resolution was announced to the Committee on the 13th August 1851, and the following establishment was fixed for the English Department.

Principal, -- --	600 0 0	
House-rent, -- --	50 0 0	
Head Master, --	400 0 0	
House-rent, --	50 0 0	
2nd Master, --	200 0 0	
3rd Ditto, -- --	150 0 0	
4th Ditto, -- --	100 0 0	
5th Ditto, -- --	100 0 0	
6th Ditto, -- --	100 0 0	
Total, -- --	1650 0 0	per mensem.

The scholarship allowance for the English and Oriental Departments was raised to Rs. 200 per mensem for 1852, and future years. Mr. Tregear's appointment to the Principalship took place on the 13th August. The Committee were at the same time requested to say how they would propose to fill up the remaining appointments in the English Department. In regard to the Oriental Departments, it was not thought necessary to increase the Establishment till the change appeared to the Committee to be imperatively needed. In the early part of the year, Mr. Marston, formerly of the Jeypore School,

who had been transferred as a Supernumerary Teacher to Bareilly, resigned the educational service. In June 1851, Mr. H. V. Ingels was appointed a Supernumerary Teacher in the Institution on Rs. 150 per mensem; and in November following, a Mr. E. Blackwell, formerly attached to the Elphinstone Institution at Bombay, was appointed an Extra Master on Rs. 200 per mensem. It was left to the Committee to decide how the duty of instructing the senior classes should be divided between Mr. Blackwell and Mr. Templeton, the present Officiating Head Master.

In informing Government of Mr. Marston's resignation, the Committee forwarded various minutes relating to the internal economy of the School. It appeared from these, that an active demand existed for admission into the School, and that the measure of raising the entrance and tuition fees was likely to be attended with advantage.

With reference to the proposition which has for some time been canvassed for introducing the Bengal scheme of studies and examinations into the Colleges of the North Western Provinces, it will be seen from the remarks made under the heads of the other Colleges, that the immediate introduction of that scheme is not likely to be attempted. As the Bareilly College is in its infancy, it cannot be expected to possess sufficiently advanced pupils to take up the studies laid down for 1st class or even 2nd class students in the Calcutta scheme, and the following extract from the Committee's letter to Government on the subject will show the disadvantages under which the students at Bareilly labour, as compared with those in Bengal, as well as some of the grounds upon which the introduction of the scheme is believed to be impracticable.

"The Committee are of opinion, that they will not be able to adopt the Council's scheme of studies for 1853. During 1853, the youths composing the 1st class will, it is believed, qualify themselves for employment, and will also have reached an age beyond which their remaining in the College is scarcely advisable. The present 2nd class, who will at the commencement of 1853 take their place, will not be able to take up such advanced studies as those of the 1st or even the 2nd class of the Council's list, but the Committee hope, that in 1854 they will be fully competent to take up the studies of the 2nd class.

"The Committee are fully sensible of the desirableness of uniformity of studies in all the Colleges, and will cordially carry out any scheme that may be decided on by the Honorable the Lieutenant Governor. They beg however to observe, that they feel the force of the objections urged by the Principal in his note, which accompanies this letter with regard to the difference of position and circumstances of the alumni of the Calcutta Colleges, and those of Bareilly,

and to submit them for His Honor's consideration. They believe a course more suitable to the wants of the people than that suggested by the Council of Education might be devised, and will shortly submit for His Honor's opinion the result of their deliberations on the subject."

The following Programme of studies was proposed for adoption during 1852.

PROGRAMME OF STUDIES FOR 1852.

1st Class, 4 Students.

Guizot's History of the Revolution; Abercrombie's Moral Feelings; Stewart's Mental Philosophy; Jones on Rent; Macbeth; Selections from Cowper and Pope; Richardson's Translations; Potter's Optics; Hall's Calculus; Mechanics; Astronomy from Brinkly. In Persian, Hafiz and Ukhlaq Julalee. In Oordoo, Chemistry and Principles of Government.

2nd Class, 20 Students.

Goldsmith's Essays; Keightley's England; Abercrombie's Moral Feelings; Clift's Political Economy; Selections from Goldsmith; Cowper and Pope; Plane Trigonometry; Elements of Calculus; Conic Sections; Introduction to Mechanics, &c.; Translation and Composition.

Oordoo Classes.

2nd Class.—Bostan Hikmut; Gilchrist's Russalah, Writing.

3rd Class.—Bostan Hikmut; Ditto, Ditto.

1st Persian Class, Section 1st.

Muqamat Hurreeree, the whole; Qootubee, the whole; Shurh Moollá, the whole; Shurh Tuhzeeb, the whole; Ukhlaq Julalee, one-half; Dewan Hafiz; History of England, to the accession of Charles the 2nd; Compositions, Principles of Differential Calculus, Chemistry, Principles of Government, Mechanics, Algebra.

2nd Section.

Zuhooree, the whole; Waqaya Niamut Khan Ali, one-half; Shurh Mait Aumil, the whole; Fusooli Akburree, the whole; Hidaitool Nuho, one-half; Munaziruh Bueed-ool-Byzamee, the whole; Algebra, Quadratic Equations; Trigonometry; Miftah-ool-Uflak, the whole; History of Persia, one-half; Geography; Principles of Political Economy, the whole.

2nd Persian Class.

Unwar Suhailee, the whole; Sikander Namah, to Jushni Nowshabah; Jouhur-ool-Turkeeb, the whole; Meezan, the whole; Moonshaib, the whole; Punj Gunj, the whole; Tarikhi Hind, the whole; Geography, Asia; Composition; Euclid, to Book 6th; Algebra, to Evolution; Arithmetic.

The following returns will show the status of the Bareilly College, on the 30th April 1852.

Establishment of the Bareilly College, on the 30th April 1852.

Names.	Designations.	Amount. Rs.	A.	P.
Vincent Tregear, Esq., ...	Principal,..	600	0	0
Mr. H. Templeton, ...	Officiating Head Master, ...	250	0	0
Mr. E. Blackwell, ...	Extra Master, ...	200	0	0
Mr. C. Gill, ...	Officiating 2nd ditto, ...	150	0	0
Mr. V. Ingels, ...	Supernumerary, ...	150	0	0
Luchmun Pershad, ...	Officiating 3rd Master, ...	100	0	0
——————4th, ...	Vacant, ...	50	0	0
Zoolfikar Ali, ...	Officiating Persian Teacher, ...	50	0	0
Qootub Shah, ...	Ditto 2nd ditto ditto, ...	20	0	0
Juwad Ali,..	Officiating Vernacular ditto, ...	40	0	0
Jeesookh Roy, ...	Ditto 2nd ditto ditto, ...	20	0	0
Ishri Pershad, ...	Ditto Librarian, ...	10	0	0
	Amount sanctioned for Scholarships,	140	0	0
	Peon, ...	4	0	0
	Duftree, ...	4	0	0
	2nd Ditto, ...	4	0	0
	Durban, ...	4	0	0
	Bearer, ...	4	0	0
	Sweeper, ...	4	0	0
	Total Rupees,.. ..	1804	0	0

Statement of the Number, Caste, &c., of Students at the Bareilly College, on the 30th April 1852.

Statement showing number of paying Students and the amount paid by them, also Students who do not pay.				*Statement showing num- of Students studying each of the languages taught.*			*Castes of Students.*		
Non-paying.	Paying, and amount realized during the year.	Amount of Entrance Fees realized.	Total.	English and Oordoo.	Persian.	Hindi.	Christians.	Hindoos.	Mussulmans.
0	302	Rs. A. P.	Rs. A. P.						
	Rs. 749 14 0	107 8 0	857 6 0	216	67	19	6	233	63

Local Receipts and Disbursements of the Bareilly College, from the 30th of April 1851 to the 30th April 1852.

Resources of Income.							Actual Charges during the year.		
Separate Fund.	*Assignment from Parliamentary grant.*	Total.	*Assignment from additional grant.*	*Establishment fixed by Government.*	*Tuition and admission fees.*	*Grand Total of Receipts.*	*Nature of Charges.*	Items.	Total.
								Rs. A. P	
							English Teachers, ...	14821 11 0	
							Oriental ditto, ...	1560 0 0	
				Rs.	Rs.	Rs.	Scholarships, ...	1560 0 0	
				19720 0 0	357 6 0	20577 6 0	Servants, ...	288 0 0	
							Librarian, ...	120 0 0	
							Fixed Contingencies, ..	144 0 0	
							Contingencies, ...	172 4 6	
							Prizes, ...	294 12 0	
							Books purchased, ...	255 4 9	
							Paid for Desks, Forms, Cases &c., ...	138 1 0	
									19349 1 3

The College re-opened in January 1851, with 267 students. 75 left and 110 were admitted during the past year, so that at its close the strength of the Institution was 302.

The total amount of fees received was Rs. 835, the average attendance was a little more than 95 per cent. and 46 scholars (nearly one-sixth of the whole,) were present every day throughout the year.

The duties were carried on in the same manner as heretofore. The Principal's time was allotted to the 1st English and 1st Persian classes. The Head Master taught the 1st English Class in part, and the 2nd class wholly, and the remaining classes were in the hands of their appropriate teachers.

The following list of students who left the Institution during 1851, will give an idea of the causes which operate to reduce its numerical strength. In the return for 1852, the Principal will furnish details of the character and emoluments of posts which the students obtain during the year.

List of Students who have left the Bareilly College during 1851.

No.	Names.	Period of Study.	Reasons for leaving.
	Daibee Purshad,	9 Years,	Employed at Shahjehanpore.
	Vuzeer Alee,	3¼ Ditto,	Dismissed for absence.
	Doulut Roy,	2½ Ditto,	No reason given.
	Misree Loll,	1½ Ditto,	Poverty.
5	Sadiq Alee,	1½ Ditto,	Left the station.
	Alla Russool,	4½ Ditto,	No reason given.
	Ramsuhai,	2 Months,	Refused to pay fine.
	Khem Kurrun,	3½ Years,	Poverty.
	Moula Bux,	4 Months,	Left the station.
10	Moolchund,	2 Ditto,	Removed to assist his father.
	Saligram,	10 Ditto,	No reason given.
	Khyratee Loll,	5 Years,	Gone to Lucknow.
	Ghoolam Hoosein,	8 Months,	Poverty.
	Jogulkishore,	1 Year,	Ditto.
15	Bankei Beharee,	1 Ditto,	No reason given.
	Ghuzzuffer Hoosein,	2 Months,	Gone to Lucknow.
	Kashee Purshad,	8½ Years,	Employed as Teacher.
	Bindrabun,	1¼ Year,	Dismissed for absence.
	Rughnath,	10 Months,	Learning at home.
20	Zynool-Abdeen,	1 Year,	Poverty.
	Khooshal Singh,	4 Years,	No reason given.
	Chirounjee Loll,	1 Year,	Dismissed for absence.
	Luchmun Purshad,	4 Years,	Ditto ditto ditto.
	J. James,	9 Months,	Gone to Agra.
25	G. Simmonds,	8 Months,	Ditto ditto ditto.
	Pirbhoo Loll,	10 Ditto,	Dismissed for absence.
	Nuzeer Sha,	4 Ditto,	Ditto ditto ditto.
	Fida Hoosein,	1 Year,	Left the station.
	Ghoolam Ahmud,	1 Ditto,	Ditto ditto ditto.
30	Saligram,	1¾ Year,	No reason given.
	Rudmaputt,	8 Months,	Left the station.
	Chudummee Loll,	8½ Years,	Got employment.
	Thakoor Doss,	10 Years,	Ditto ditto ditto.
	Ali Jan,	1¼ Ditto,	Dismissed for absence.
35	Rajah Kurtap Singh,	2½ Ditto,	Learning at home.
	Khoonnee Loll,	8 Months,	Dismissed for absence.
	Fukeera,	5 Ditto,	Left owing to his father's death.
	Soondur Loll,	5 Ditto,	Dismissed for absence.
	Nundkishore,	2 Ditto,	Ditto ditto ditto.
40	Kalka Purshad,	2 Ditto,	Ditto ditto ditto.
	Doulut Singh,	3 Ditto,	Left the station.
	Huzaree Loll,	1¼ Year,	Gone to Lucknow.
	Pirbhoo Loll,	6 Months,	Gone to Mooradabad.
	Imam Khan,	1½ Year,	Ditto ditto ditto.
45	Bhoop Singh,	3 Months,	Dismissed for absence.
	Chotay Loll,	5½ Years,	Ditto ditto ditto.
	Anundee Loll,	1½ Ditto,	Left the station.
	Shibchunder,	2 Months,	Removed by his father.
	Mohomud Hoosein,	7 Months,	Gone to Shahjehanpore.
50	Narain Doss,	1¼ Year,	Gone to Muthra.
	Rampershad,	7 Years,	Gone in search of employ.

No.	Names.	Period of Study.	Reasons for leaving.
	Daibee Doss,..	10 Months,..	Gone to Futtehgurh.
	Abdul Ruhman, ...	9 Ditto, ..	Gone to Roorkee.
	Ghoolam Kadir, ...	7 Ditto, ..	Gone to Shahjehanpore.
55	Nurbuda Purshad,.. ..	2¼ Years, ..	Gone to Sealkote.
	Ram Chund, ...	1 Year, ..	Left with the Pundit.
	Hurree Dutt,..	1 Ditto, ..	Ditto ditto.
	Shimbhoo, ...	10 Months,..	Ditto ditto.
	Buddree.	10 Ditto, ..	Ditto ditto.
60	Kurtap Singh, ...	2 Ditto, ..	Ditto ditto.
	Gujraj Singh, ...	10 Years, ..	Employed at Shahjehanpore.
	Buldeo Singh, ...	4 Ditto, ..	Dismissed for absence.
	Bhowanee Dutt, ...	1½ Ditto, ..	Gone to Muthra.
	Umjud Ali, ...	7 Days, ..	Removed by his father.
65	Azeez-ood-deen, ...	4 Years, ..	Gone to Futtehgurh.
	W. Peatts, ...	2 Ditto, ..	Gone to Agra.
	A. Sergeant,..	9 Months,..	Gone to Peshawur.
	Daibee Suhai, ...	1 Year, ..	No reason given.
	Yakoob Ali, ...	7 Months,..	Dismissed for absence.
70	Narain Dass,..	1 Ditto, ..	Withdrawn by his father,
	Gunga Purshad, ...	1 Ditto, ..	Ditto ditto ditto.
	N. DeGruther, ...	1 Ditto, ..	Returned to Futtehgurh.
	Hur Suhai, ...	5 Years, ..	Dismissed for absence.
	Seetaram.	10 Months,..	Withdrawn by his father.
75	Alee Ahmed,..	3 Years, ..	Gone to Meerut.

The examination of the pupils was held as usual in December 1851. Papers on the following subjects had been previously forwarded by Government, but it does not appear that they were all set at the examination.

1 Paper on Mathematics, Natural Philosophy and Astronomy.
1 ,, ,, Gibbon's Decline and Fall.
1 ,, ,, Hume's History of England.
1 ,, ,, Taylor's History of British India.
1 ,, ,, Clift's Political Economy.
1 ,, ,, Paley's Natural Theology.
1 ,, ,, Arabic Literature, comprising Hureeree, Shurrah Moolla and Soollum.

Two papers on the Histories of England and Rome were prepared on the spot and put to the 2nd class.

The questions on the above subjects did not embrace the whole of each work mentioned; but certain portions only which had been selected for study by the Principal.

The following gentlemen assisted in examining the answers.

Major Showers examined the 1st and 2nd English classes in the Scholarship exercises: *i. e.* the 1st class in Natural Theology and Political Economy, and the 2nd class in the Histories of England and India.

Captain Jones took up the answers of the 1st class to Gibbon, and,

Dr. Kirk the answers to Cowper, and the papers on Astronomy.

On summing up the decisions of the examiners on the merits of the students, and taking into consideration their conduct in the College, the following students were recommended for scholarships of the amounts entered opposite their names.

1st English Class.

	Rs.	A.	P.
Doorgah Purshad,	25	0	0
Uzmut-oollah,	15	0	0
Ram Purshad,	15	0	0
Bholanath,	7	0	0
Total Rupees,	62	0	0

1st Persian Class.

	Rs.	A.	P.
Jumaloodeen,	15	0	0
Gopal Purshad,	15	0	0
Mohomed Hussun,	10	0	0
Fukhr-oodeen,	10	0	0
Agha Alee,	10	0	0
Moorli Dhur,	8	0	0
Sahib Rae,	8	0	0
Total Rupees,	76	0	0

2nd English Class.

	Rs.	A.	P.
Soonder Loll, 2nd.,	10	0	0
Soonder Loll, 1st.,	8	0	0
Chunput Rae,	5	0	0
Salig Ram,	5	0	0
Meva Ram,	4	0	0
Huzuree Loll,	4	0	0
Suda Nund,	4	0	0
Total Rupees,	40	0	0

2nd Persian Class.

	Rs.	A.	P.
Ishree Purshad,	5	0	0
Mehdee Alee,	5	0	0
Mohomed Hoosein,	4	0	0
Nurotum Singh,	4	0	0
Salig Ram,	4	0	0
Total Rupees,	22	0	0

The following extract from Major Shower's report touches on a question of considerable importance.

"The boys would derive benefit, if they had opportunities of talk-"ing over the subjects of their studies with one another. The best "means of affording these opportunities would be by obliging them "to continue at the College premises the whole day, and taking their "meals there. It would strengthen and confirm wholesome and "sound opinions, and correct the trifling and imaginative notions "which native youth are apt to take up: and independently of these "advantages, the measure would raise up among them something of

"social feelings, the encouragement of which would serve to the full "to improve the characters of the alumni of our Colleges, as the most "highly cultivated abilities. This is a subject which is worthy of the "best consideration of the heads of our Educational Institutions."

These suggestions were noticed by the Lieutenant Governor in the following terms:

" His Honor's notice has been attracted by the remarks made by Major Showers as to the expediency of retaining the pupils in attendance in the College premises during the whole of the day. The Lieutenant Governor regards the subject as worthy of consideration; and especially so with reference to a proposition which has been elsewhere suggested of boarding and lodging the boys in some place, where they should be always under discipline. If a system of this kind were well organized, youths might be brought from a distance, and the influence of this College might thus be extended over a much larger sphere than at present.

With these views His Honor requests the attention of the Committee to the subject, which is daily becoming of increased importance in connection with the plan now in progress, for promoting vernacular education throughout the country."

The Most Noble the Governor General visited this Institution a few days before the commencement of the vacation (January 1852), and on that occasion observed:

" I have been well pleased with all I have heard and all I saw of the College at Bareilly, its direction, its success, and its prospects of increasing usefulness."

The Principal expressed himself satisfied with the zeal and assiduity of the several Teachers and Masters; and the Lieutenant Governor received with confidence the assurance of the Committee, that the Institution was advancing favourably.

ROORKEE COLLEGE.

FIRST DEPARTMENT.

NUMBER OF STIPENDIARY STUDENTS,—8.

Number.	Name.	Caste.	Age.	From	Date of Nomination to the College.	Date of Arrival at Roorkee.	Date of Appointment.	Date of Leaving.	Situation.
1	Ameer Khan,	Pathan,	18 6	Dehlie College,	Feby. 3rd 1848,	March 12th 1848,	March 7th 1851,	Feby. 11th 1851.	Sub-Assistant Civil Engr. 5th Division, Ganges Canal.
2	Hurree Churn,	Brahmin,	20	Agra ditto,	June 19th 1849,	Feby. 21st 1850,	Feby. 14th 1852,	March 13th 1852	S. A. C. E., west of Jumna Canal.
3	Kunhya Lall,	Kayuth,	18	Ditto ditto,	April 6th 1850,	June 24th 1850,	Feby. 21st 1852,	March 16th 1852,	Saharunpore.
4	Nilmuni Mitra,	Ditto,	21	Free Church Institution, Calcutta.	Nov. 21st 1850,	March 3rd 1851.			

SECOND DEPARTMENT.

NUMBER OF STUDENTS,—15.

No.	Names.	Rank and Corps.		Date of Joining the College.	Date of Leaving.	Remarks.
22	H. Mitchel, ..	L. Corporal, .	2d E. B. Fusiliers, ...	Feb. 11th 1850,	Jany. 11th 1851.	Assistant Overseer 4th Division, Ganges Canal.
23	J. T. Lannen, ..	Gunner, ..	1st Co. 3rd Bde. Arty., ..	June 5th 1850,	Jany. 3rd 1851,	Ditto 1st ditto ditto.
24	J. P. Jones, ..	Corporal, .	2d Tr. 3rd B. H. A., ..	June 7th 1850,	Feby 18th 1851,	Ditto Kurnaul & Loodianna Road.
25	T. H. Wilson, ..	Gunner, ..	4th Co. 3rd Bde. Arty., ..	Ditto 7th 1850,	Jany. 3rd 1851,	Ditto 4th Division, Ganges Canal.
26	D. Deady, ..	Serjeant, ..	3rd ditto, 2d ditto ditto,	July 26th 1850,	May 26th 1851,	Ditto 7th ditto, Grand Trunk Road.
27	A. Baker, ..	Ditto, .. .	2d ditto, 3rd ditto ditto.	Jany. 7th 1851,	Dec. 10th 1851,	Ditto Eastern Jumna Canal.
28	J. Lester, ..	Corporal, .	3rd ditto, 3rd ditto ditto,	Jany. 14th 1851,	Dec. 9th 1851,	Ditto Punjab Civil Works.
29	F. Scotland, ..	Corporal, .	Sappers and Miners, ..	Feb. 8th 1851,	Dec. 9th 1851,	Ditto ditto ditto.
30	H. Reynolds, ..	Bugler, ..	2d Co , 1st Battn. Arty.,	Jany. 13th 1851,	Dec. 9th 1851,	Ditto ditto ditto.
31	W. Blazley, ..	Corporal, ..	2d ditto, 1st ditto ditto, ..	Jany. 13th 1851	Dec. 9th 1851,	Ditto ditto ditto.
32	M. Perry, ..	Gunner, .	2d ditto, 5th ditto ditto, ..	Jany. 9th 1851,	Oct. 8th 1851,	Remanded to his Company.
33	J. Finn, ...	Serjeant, ..	3rd Tr. 3rd Bde. H. A. ..	Jany. 14th 1851,	Dec. 9th 1851,	Assistant Overseer Punjab, Civil Works.
34	J. Whelan, ..	Bombardier, ..	3rd Co., 6th Battn. Arty.,	Jany. 11th 1851,	Dec. 9th 1851,	Ditto 4th Division, Ganges Canal.
35	S. McKenny, ..	Gunner, ..	1st ditto, 2d ditto ditto. ..	Jany. 15th 1851,	Nov. 4th 1851	Sub-Assistant Baree Dooab, Revenue Survey.
36	C. Maitland, ..	Private, .	2d En. B. Fusiliers, ..	Jany. 7th 1851	Dec. 9th 1851,	Assistant Overseer, Western Jumna Canal.
37	J. Sheehan, ..	Gunner, .	3rd Co., 4th Battn. Arty.,	Jany. 14th 1851,	Nov. 4th 1851,	Sub-Assistant Baree Dooab, Revenue Survey.
38	J. Chalmers, ..	Corporal, ..	Sappers and Miners, ..	Jany. 21st 1851,	July 16th 1851,	Leave preparatory to purchase of discharge.
39	C. Vaughan, ..	Gunner, ..	2d Co., 2d Battn. Arty.,	Jany. 14th 1851	Dec. 9th 1851,	Assistant Overseer 7th Division. Public Works, Cawnpoor.
40	E. McMillan, ..	Gunner, .	4th ditto, 1st ditto ditto,	Jany. 7th 1851,	Dec. 9th 1851,	Ditto, Punjab Civil Works.
41	J. Murphy, ..	Gunner, ..	1st ditto, 4th ditto ditto,	Jany. 15th 1851,	Dec. 9th 1851,	Ditto, 6th Division, Ganges Canal.

THIRD DEPARTMENT—SENIOR DIVISION.

NUMBER OF STIPENDIARY STUDENTS,—8.

Number.	Names.	Caste.	Age.	From	Date of Joining the Division.	Date of Leaving the College.	Remarks.	Monthly salary of situation obtained.
1	Shib Sahai, ...	Kayuth, ..	20	Junior Division,	Sept. 1st 1850,	Oct. 3rd 1851,	Superintendent of Roads, Mynpoory District.	50
2	Kedar Nath, ...	Bunya, ..	20	Dehlie College, ..	Sept. 19th 1850.	Dec. 1st 1851,	Draftsman and Surveyor, Office of Collector of Meerut. ..	52
3	Abdool Hufeez, ..	Sheikh, ..	17	Ditto, ...	Sept. 19th 1850.			
4	Balmokund, ...	Brahmin, ..	21	Ditto, ...	Jany. 19th 1851			
5	Mohun Lall, ...	Bunya, ..	20	Ditto, ...	Jany. 19th 1851,	Oct. 1st 1851,	Pergunnah Visitor of Schools, Roorkee.	30
6	Abdoor Rizak, ..	Sheikh, ..	17	Ditto, ...	July 14th 1851			
7	Kazim Ali, ...	Syud, ..	18	Ditto, ...	July 14th 1851.			
8	Goolam Hyder, ..	Sheikh, ..	23	Junior Division, ..	Sept. 1st 1851			
9	Abdoor Ruhman, ..	Ditto, ..	19	Bareilly College, ..	Sept. 15th 1851.			
10	Guneshee Lall, ..	Kayuth, ..	19	Junior Division, ..	Jany. 1st 1852			

THIRD DEPARTMENT—JUNIOR DIVISION.
No. of Stipendiary Students,—16.

	Names.	Caste.	Age.	From	Date of Joining the College.	Date of Promotion to Senior Dvn.	Date of Leaving the College.	Situation.	Salary.	Remarks.
27	Musseeh Oolla, ...	Sheikh, ..	19	Dehlie College,	Nov. 21st 1849,	.. .. ..	Oct. 4th 1851.	Native Surveyor under W. T. Dodsworth, Surv. G. C., ..	20	
29	Nuthoo Sing, ...	Rajpoot, ..	17	Roorkee, ..	Dec. 19th 1849,	.. .. .	Nov. 18th ,,	Ditto, Eastern Jumna Canal,	20	
30	Nuzeer Hoosein, ..	Syud, ...	18	Munglour, ..	Feby. 13th 1850,	.. .. ..	Oct. 7th ,,	Ditto, under Mr. W. T. Dodsworth, Surv. G. C., ...	20	
31	Mahomed Ismael, ..	Sheikh, ..	18	Dehlie College,	March 11th ,,	.. .. ..	Oct. 9th ,,	Ditto ditto, ...	20	
32	Fyzool Hoosein, (2d)	Ditto, ...	17	Ditto ditto, ..	June 17th ,,	.. .. ..	July 1st ,,	Ditto, under C. E. of Punjab.	25	
33	Gunnesha Lall, ...	Kayuth, ..	18	Saharunpoor, ..	July 18th ,,	Jany. 1st 1852				
34	Elahee Buksh, ...	Rajpoot Musulman.	19	Deobund, ...	July 20th ,,	.. .. ..	Nov. 16th ,,	Ditto, Eastern Jumna Canal,	20	
35	Kurreem Oollah, ..	Sheikh, ..	22	Dehlie College,	Aug. 27th ,,	.. .. .	July 1st ,,	Ditto, under C. E. of Punjab,	20	
36	Gholam Hyder, ...	Ditto, ...	22	Ditto ditto, ..	Sept. 3rd ,,	Sept. 1st 1851.				
37	Moonnah Lall, ...	Bishasi Bunya,	17	Moradabad, ...	Sept. 7th ,,					
38	Fyzool Hoosein, (3d)	Sheikh, ..	16	Munglour, ...	Sept. 12th ,,	.. .. ..	July 18th ,,	N. S. 8th Dn., Ganges Canal,	15	
39	Kasim Ali, ...	Ditto, ...	18	Dehlie College,	Sept. 12th ,,	.. .. ..	April 16th ,,	.. .. ..	..	Struck off at his own request; receiving Certificate.
40	Abdoor Ruhman, ..	Moghul, ..	20	Delhie, ...	Decr. 1st ,,	.. .. ..	Jany. 2nd 1852,	.. .. ..	..	Withdrawn; afterwards draftsman, Office of Supt. W. Jumna Canal.
41	Abdoollah, ...	Sheikh, ..	19	Deobund, ...	Decr. 5th ,,					
42	Ahsan Oollah, ...	Ditto, ...	17	Meerut, ...	Decr. 24th ,,					
43	Sheikh Ahmud	Ditto, .. .	15	Dehlie College,	Decr 24th ,,					
44	Mooshtak Ahmud, ..	Ditto, ...	19	Deobund, ...	April 16th 1851.					
45	Kunhya Lall, (3d) ..	Bunya, ..	21	Nujeebabad, ..	July 1st ,,					
46	Wuheed-ood-deen,	Sheikh, ..	21	Deobund, ...	July 1st ,,					
47	Fyzool Hoosein, (4th)	Syud, ...	19	Dehlie College,	July 1st ,,					
48	Allah-ood-deen, ..	Sheikh, ..	19	Bijnour, ...	July 5th ,,					
49	Shew Pershad, ...	Kulal, ..	17	Dehlie College,	July 5th ,,					
50	Abdoollah, (2d)	Sheikh, ..	19	Roorkee, ...	Julyt 11th ,,					
51	Hubeeb Hussup, ..	Ditto, ...	18	Rampoor, ...	Augt. 4th ,,					
52	Fyzoollah Khan, ..	Putthan, ..	21	Agra College, ..	Aug. 25th ,,					
53	Hurgoo Lall, ...	Brahmin, ..	18	Roorkee, ...	Sept. 1st ,,					
54	Abbas Ali, ...	Syud, ...	19	Dehlie College,	Jany. 1st 1852.					
55	Muhumood Buksh, ..	Mahmood Buksh.	21	Roorkee School,	Jany. 3rd ,,					
56	Gholam Hussain, ..	Syud, ...	17	Ditto ditto, ..	Jany. 3rd ,,					
57	Kulyan Rai, ...	Brahmin, ..	18	Bughra, ...	Jany. 9th ,,					
58	Neeaz Hussun, ..	Syud, ...	19	Roorkee School,	Feby. 20th ,,	.. ..	.. ..	.. .. ..	..	Non-Stipendiary.
59	Yoa Ali, ...	Ditto, ...	20	Dehlie College,	Feby. 23rd ,,					

NON-STIPENDIARY LIST.

FIRST GRADE.

Number.	Names.	Age.	Date of Joining.	Date of Leaving.	Situation.	Remarks.
1	C. T. Scott, ..	17	Dec. 17th 1849, ..	Dec. 24th 1851, ..	Asst. Ex. Officer, Baree Doab Canal,	Subsequently appointed Cadet of Infantry.
2	C. Anderson, ..	17	Oct. 8th 1850, ..	Dec. 1st 1851, ..	Proby. Asst. Ex. Officer, Northern Dn. G. C.	
3	E. Swetenham, ..	17	Oct. 22nd 1850.			
4	C. F. Boulton, ..	20	March 31st 1850, .	Nov. 22nd 1851, .	Sub-Asst. Rev. Surveyor, Rohilcund,	Subsequently appointed Cadet of Infantry, Bombay Establishment.
5	F. Cussen, ...	..	April 13th 1851, .	Dec. 1851, .	Asst. Ex. Officer, Baree Doab Canal.	
6	W. C. Tayler, ..	20	August 1st 1851.			
7	L. Bean, ...	18	Nov. 12th 1851.			
8	C. E. Wheatley, ..	18	Nov. 17th 1851.			
9	W. Hogan, ...	21	Jany. 5th 1852.			
10	W. Carte, ...	18	Jany. 1st 1852.			

NON-STIPENDIARY LIST.

SECOND GRADE.

Number.	Names.	Age.	Date of Joining.	Date of Leaving.	Situation.	Remarks.
1	J. Todd, ...	15	January 14th 1850.			
2	F. Platts, ...	16	January 21st 1850, ..	July 27th 1850, ...	.. .. ..	Withdrawn.
			September 26th 1850, ..	October 13th 1851, ...		
3	F. Wharton, ...	18	March 4th 1850.	.. ..	.. .. ..	Withdrawn.
4	A. Cawood,..	15	September 23rd 1850.			
5	J. Bradshaw, ...	17	February 13th 1851.			
6	J. Douglas,..	15	April 7th 1851.			
7	R. H. Robert, ...	17	July 13th 1851.			
8	W. Kelly, ...	18	February 28th 1852.			

Detailed Statement of Salaries and Establishment of the Civil Engineering College, as on the 1st August 1852.

Department and date of Government Order constituting each Office and Establishment existing on the 1st of August 1852.	*Description of Service.*	Authorized, *No.*	*Amount of Salary.*	*Total.*
Genl. Dept., 19th Oct. 1847,	Principal,	1	600 0 0	
16th December 1847,	Head Master,	1	300 0 0	
Ditto, ditto,	Architect Drawing Master,	1	200 0 0	
Temporary, 22d May 1852,	Asst. to Head Master,	1	120 0 0	
16th December 1847,	1st Native Teacher,	1	120 0 0	
Ditto, ditto,	2nd Ditto ditto,	1	50 0 0	1390 0 0
	Scholars.			
25th November 1847,	1st Department,	8	40 0 0	320 0 0
General Department, 20th June 1850,	3rd Department, Senior Division,	8	10 0 0	80 0 0
Genl. Dept., 25th Nov. 1847,	Ditto, Junior Division,	32	5 0 0	160 0 0
	Establishment.			
8th February 1851,	English Writer,	1	35 0 0	35 0 0
22d October 1850,	Duftree,	1	10 0 0	10 0 0
18th December 1847, 20th June 1850, 22d May 1852, and 14th June 1852,	Tindals,	4	5 0 0	20 0 0
	Khulassees,	24	4 0 0	96 0 0
	Chuprassees,	2	5 0 0	10 0 0
	Bearer,	1	5 0 0	5 0 0
	Chowkeedar,	1	5 0 0	5 0 0
	Sweeper,	1	4 0 0	4 0 0
	European Barracks.			
	Cooks,	5	6 0 0	30 0 0
	Bhisties,	4	5 0 0	20 0 0
	Dhobies,	5	6 0 0	30 0 0
	Chowkeedars,	1	5 0 0	5 0 0
	Sweepers,	4	4 0 0	16 0 0
				2236 0 0

Detailed Statement of Salaries and Establishment of the Civil Engineering College Press, on the 1st August 1852.

Department and date of Government Order constituting each Office and Establishment existing on the 1st of August 1852.	*Description of Service.*	Authorized,								
		No.	*Amount of Salary.*			*Total.*		
Home Department No. 224, dated the 14th October 1851.	Superintendent, ...	1	200	0	0	200	0	0
	Typographic Department.							
Ditto ditto ditto, ..	Head Printer, ...	1	100	0	0	100	0	0
	European Compositor, ..	1	50	0	0	50	0	0
	Apprentices, ...	2	30	0	0	60	0	0
	Native Compositors, ...	2	12	0	0	24	0	0
	Ditto Distributors.	2	8	0	0	16	0	0
	Ditto ditto, ...	2	6	0	0	12	0	0
	Pressmen, ...	2	16	0	0	32	0	0
	Inkmen, ...	2	8	0	0	16	0	0
	Warehouseman, ...	1	10	0	0	10	0	0
	Folder, ...	1	5	0	0	5	0	0
	Khulashies, ...	2	4	0	0	8	0	0
	Bheestie, ...	1	5	0	0	5	0	0
	Lithographic Department.							
Financial Department, Secretary to Government, North Western Provinces, No. 1913 of 1852, dated the 9th July 1852.	Persian Lithographic Writer, ...	1	20	0	0	20	0	0
	Pressmen, ...	2	7	0	0	14	0	0
	Coolies, ...	4	4	0	0	16	0	0
						568	0	0

Roorkee College.

The following details of the operations of this Institution during the official year 1851-52, *are taken from Lieutenant Maclagan's Report.*

In January 1851, the enlargement of the 2nd Department from 10 to 15 took effect, and at the same time likewise, the new arrangement referred to in last Report; the whole fifteen entering together, and so being enabled to pursue their studies simultaneously. A similar arrangement did not fully take effect as was contemplated in the other Departments; in the first, as there were no new candidates prepared to join at the time appointed for general admission of stu-

dents; in the third, as there were not vacancies to the extent requisite for carrying out this arrangement.

On January 1st 1851, the Press of the Simla Magnetic Observatory was formally transferred to the Roorkee College, but the requisite buildings not having been erected at Roorkee, the actual removal of the Press from Umballa was deferred. The state of the Press buildings and of those erected for the accommodation of the European portion of the Press Establishment admitted of the actual transfer taking place in the beginning of this year.

In addition to this Typographic Press, implements and materials for a Lithographic and for a Book-binding Department were procured from England, and on the arrival at Roorkee of the Press Establishment from Umballa, operations were commenced on a small scale in the Lithographic Department under the direction of Mr. W. H. Carey, who had been appointed general Superintendent of the Press. Subsequently a small temporary establishment was authorized as noted in the margin* at a monthly expense of Rs. 35, till arrangements should be ordered for the maintenance of a complete Lithographic and Book-binding Establishment. The operations of the Lithographic Department have been confined to the printing of Geometrical papers in Urdoo for the use of Village Schools, &c. The delay occasioned by the materials being all new, and unprepared for work, and by the demand for the Superintendent's time and attention in arrangeing the details of the Typographical Department on its commencing work at Roorkee, necessitated the relinquishment for the present of some other Lithographic efforts on a larger scale. The lithographing of Urdoo in the Persian character is being continued, the work on which the Press is now to be engaged being a translation of part of the "Manual of Surveying," which will be noticed below. The Drawings of Hall's Brick Machine, which have been partially prepared for Lithography at Roorkee, being particularly required, will now be printed at the Secundra Press.

*1 Persian Writer, ...	Rs. 20
1 Pressman, ...	„ 7
2 Coolies, @ 4, ...	„ 8
	Rs. 35

A set of tools for wood engraving also have been procured from England. The advantage of this mode of illustrating Practical and Mathematical works, by which diagrams can be given along with the letter-press, is obvious. As yet nothing has been done in the wood-cutting department; but an important auxiliary circumstance should be noticed, namely, that box-wood, which appears well adapted for the purpose, has been procured by Colonel Cautley from a locality in the hills in the comparative neighbourhood of Roorkee. The suitableness of the Himalayan box-wood for engraving is already well known, and the specimens of engraving on it, which have recently appeared in the Madras Journal of Arts, are satisfactory evidences of the fact.

In October 1851, authority was received for a further augmentation of the 2nd Department from 15 to 30, and for the construction of the necessary buildings: the buildings were immediately commenced, and arrangements made for obtaining the requisite number of additional students. The candidates were numerous, but the examinations could not be completed in time to admit of the whole increased number joining together on the 1st January. Nor could the buildings be ready by that time. It was accordingly arranged that for the present year, a second admission should take place a few months subsequently.

The works prepared for publication in connection with the College during the period under review, have been the following:

1st. Translation in Urdoo, by Munnoo Lall, 1st Native Master, of Abbott's Treatise on Bridges, with Cautley on Well Foundations.

2nd. Translation by the same, of C. E. College Paper No. 1, on Materials.

3rd. Ditto Ditto, of Paper No. II., Strength of Materials.

4th. Ditto, by Kunhya Lal, student of the first Department, of Mr. Tresham's Paper on Blasting under Water by means of Galvanisim.

5th. Translation by Beharee Lall, 2nd Native Doctor, revised by Moulvee Kadir Ali, Zillah Visitor of Schools, of the Section of the "Manual of Surveying" on "Khusrah."

6th. Papers proposed for the use of the C. E. College, No. III. being the first part of a technical Vocabulary and Diagogues for the use of Assistant Overseers in the Department of Public Works.

The above are completed; Nos. 1 and 4 are published, No. 5 will be lithographed immediately; the others are in the Press, Nos. 2 and 3 at Secundra, No. 6 at Roorkee. A translation of the first Section of the Manual of Surveying, on Practical Geometry, &c., is in the hands of Ramchundra teacher of European Science in the Dehlie College, to whom it was committed when the only qualified persons available at Roorkee had their hands full. This work is much wanted, and will, it is believed, be found very useful in the 3rd Department of this College and elsewhere. No. IV. of the C. E. College Papers, on earth-work constructions is also in course of preparation, and part has been printed.

In the preparation of Urdoo translations,—some difficulty has been experienced from the defect of suitable renderings of various scientific terms in Urdoo. This was particularly felt in translating

the paper on Strength of Materials, which translation is not supposed to be, in its present state, altogether as it should be. Those terms have been adopted, which, after careful consideration, appeared most accurately to express the desired meaning; but the publication of this and of the other translations will, it is hoped, lead to the detection of such terms as are faulty, and to suggestions of amendments. On this account, as well as with a view to the improvement of the translation generally, the free criticism of them by competent persons is much to be desired. Translations into Urdoo by Natives of India are liable to defects from two causes; the translator's imperfect acquaintance with peculiar forms of expression in the original, and his tendency to make use of incorrect idioms in his own language, whilst applying himself closely to the English, and particularly to the work before him. It is true that mistakes of this latter kind would in general be corrected in a second reading, but not always, and I have had opportunities of noticing the difficulty a Translator has experienced in deciding whether a certain form of expression in his own language, perhaps a very familiar one, is ever in use or not. The last Urdoo translation prepared at the College has been entirely revised as above noticed, with the aid of Moulvee Kadir Ali, a good oriental scholar, unacquainted with the English language, which mode of proceeding is the best adapted for ensuring accuracy of diction, and is also in many cases a good means of arriving at correct renderings of technicalities. The importance of the work of translation is acknowledged. It needs however in many cases to be a work of adaptation rather than of direct translation, and more accordingly is required in a translator than an acquaintance with the two languages he has to deal with; except in the case of works specially prepared for India, there are few on practical subjects, connected with Engineering especially, of which a mere translation would make a good and useful book in Urdoo.

An Urdoo Vocabulary of Scientific terms has long been felt to be a most important desideratum. A beginning has been made, particularly in the Department of the Visitor General of Schools, North Western Provinces, of a collection under their respective heads of the terms in some few branches of Science in Urdoo or Hindee; and from various Scientific books in the allied languages, now being procured by order of the Honorable the Lieutenant Governor, much assistance may be expected in the prosecution of this work. It is especially desirable that it should be carried on systematically, and by the combined labours of as many as possible of those engaged in the work of tuition, or of translation in this country.

The communications, official and private, received during the past year from various quarters, consisting of requisitions on the College for trained students, applications for admission, and requests for information, have been numerous. Of the requisitions several remain yet

to be complied with, the number of qualified students having been insufficient: some again, which it was found impossible to comply with at the time, have ceased to be retained as requisitions on the College, the want having been supplied otherwise. The small number of admissions, compared with that of the applications, is due partly to the want of the necessary accommodation, partly to the failure of the candidates in the preliminary test, partly to the very indefinite ideas of some of the applicants as to what they were applying for. All the Departments have been complete, except the first, at some time during the period over which this report extends, but not permanently so, owing to causes which will be mentioned in their proper places.

First Department.

The first student of this Department appointed a Sub-Assistant Civil Engineer, left the College on the 11th February 1851, being posted to the 5th Division of the Ganges Canal.

The progress of an ex-student, after entering on the duties of the situation to which he has been appointed, does not properly come within the province of a report on the College, but as the student above alluded to, has lately been brought prominently to notice, not to his advantage, and there are circumstances connected with his case bearing upon his previous instruction, I take the opportunity of making a few observations on the subject.

I have before had occasion to notice the tendency of native students of English, in their ambition of distinguishing themselves, to despise what is elementary and familiar to others of more limited attainments (possibly on this very account,) and to set too high a value on the mere acquisition of some familiarity with branches of knowledge which, holding a higher place in the scale of learning, are unapproached by smaller men regarding such knowledge as an *end*, and not as a *means*. That this is really the case, there are frequent opportunities of observing, alike in the departments of literature and of science, and the case of this student offers an illustration That he is still defective in the knowledge of the plain and practical applications of Elementary Mathematics argues a defect in his instruction at Roorkee; and perhaps in spite of the conviction, (no recent one) of the very general tendency above noticed, too much has been taken for granted in the case of students entering the College with mathematical acquirements. Most certain it is, that as a general rule, those who have entered with lower attainments, have been found more apt and more accurate in those practical applications of mathematical knowledge which come within the reach of both; and which, as they are of most daily occurrence, it is most essential to a practical man's usefulness that he should be familiar with.

The next two native students of this Department have left the College since the beginning of this year. They entered at different times, but latterly have pursued their studies together, and were at the close of last year, examined together on the subjects studied during their residence at the College. A few of the answers of each to the questions proposed on Engineering and Geodesy, are given in the Appendix.

In the Department of Geodesy, they have been engaged during the past year in filling in the details of a Trigonometrical Survey in the neighbourhood of Roorkee, and in some minor surveys and lines of levels. In Plan Drawing, both have attained considerable proficiency. In Surveying and other field-work, requiring personal energy, Kunhya Lall is the more successful, and is likely to prove the more useful Assistant. The other is industrious and careful, though less active.

Second Department.

In the beginning of 1851, as has been above noticed, the new arrangement providing for the simultaneous entrance of the whole Department, (15) took effect for the first time. Five of the students of the previous year, who had joined on various dates in 1850, still remained on 1st January 1851.

The fifteen Non-commissioned Officers and Soldiers nominated, all joined on or about the date named, 15th January, with the exception of one, delayed by repeated sickness on his march from Attock to Roorkee. The number was reduced before the end of the year to eleven. One left the College in July, to join a civil situation in the Punjab, having obtained six months' leave of absence from the Commander-in-Chief preparatory to procuring his discharge from the army by purchase. One who had failed to make satisfactory progress and whose conduct otherwise had been reprehensible, was, on the recommendation of the Principal, removed by the Commander-in-Chief, and remanded to his corps. Two were appointed to the Revenue Survey Department, and were required to join their appointments in the Baree Doab before the expiry of the College sessions in December, when the survey working session would have been far advanced.

The general progress of this Department has been satisfactory, and the proficiency of a few, particularly in mathematics, plan drawing, pencil sketching and surveying, very commendable. The names of the most successful in these several branches, are given in the prize list which is annexed.

Of the fifteen who have joined in the beginning of this year, I need not do more than mention that there are several who give good promise. The particular report of their whole progress, and of

that of the additional number who are shortly to enter the College, will belong to my successor.

Third Department, Senior Division.

This is the class of native students, from which I am disposed to believe that the most satisfactory results will be obtained ; an opinion formed on general grounds, rather than on the strength of particular instances, or with reference to past experience. It appears to me that if the time and energies devoted by some to the study of English, be given by others to the acquisition of useful knowledge of other kinds through the medium of their own language, the latter, when possessed of equal abilities, are likely to make a more rapid and a more intelligent progress in those scientific studies which are pursued by both; by the former in the English language, by the latter in their own. It is true that the means are yet wanting for presenting to them in the Urdoo the various scientific works, and practical instructions connected with engineering studies, which are accessible to students having a knowledge of the English language. But this is a want which will, it is hoped, be gradually and ere long supplied.

Considering the present imperfect means of instruction by books, the progress of the students of this Division who have left the College receiving appointments, is encouraging. The general list will show the nature of the employments which they have obtained.

Admission to this class is open both to students of the Junior Division, who may qualify themselves whilst studying at the College for passing the higher test prescribed for the Senior Division, and to properly qualified candidates from without; which system is, on more than one account, beneficial, and ought, I think, to be retained.

Third Department, Junior Division.

The number of stipendiary students on the roll of this class has been complete almost uniformly throughout the past year; but in consequence of an unusually prevalent and long continued sickness (among the native students and establishments generally) the number available for employment in the public service was comparatively small; and several of the demands for native surveyors and levellers, compliance with which was confidently expected, remain unsupplied. Other causes also have contributed to lessen the number of trained students available for employment; the premature withdrawal of some, desirous of returning to their homes, or of seeking employment for themselves; and the disinclination of others to accept situations at a distance, preferring rather to wait in the hope of obtaining employment nearer home, though of less value.

The applications for admission have been very numerous, and the stipendiary list being full, several of the applicants have, instead of waiting for vacancies, preferred to be examined at once, and being found qualified to enter as non-stipendiary students and work with the others, being afterwards admitted to the stipendiary list, as vacancies occur. This circumstance may suggest an alteration of the rule regarding admission, to the effect that the very moderate attainments at present required should be held as qualifying for admission as non-stipendiary students only; the Government subsistence allowance being made the accompaniment of a somewhat higher proficiency,—a step in advance towards the standard prescribed for the senior division. The contemplated increase of students might thus be made in this class without additional expence on account of stipends. It should be noticed, that this would be simply recurrence to the system originally proposed by Major Baker, in the sketch drawn out by him in 1847, of the contemplated Institution at Roorkee.

It will be observed that the students of this class are now drawn principally, not from other Government Colleges, as at first, but from town and village schools in the Saharunpore and neighbouring Districts. Of the nineteen students on the roll on 1st March, six only are from the Government College from Agra, and one from Dehlie. The students who have joined from the Roorkee and Deobund Tehseelee schools have all possessed on admission some acquaintance with Geometry, in addition to the proficiency required by the existing regulations.

Non-Stipendiary English Class.

These are of two grades, the first composed chiefly of sons of Officers in the Army; the second, the sons of Uncovenanted Servants of Government, and Non-Commissioned Officers. The several individuals composing these classes, as they enter with attainments varying greatly in extent, pursue their studies for the most part independently. The minimum proficiency qualifying for admission to either grade is that laid down for military students of the second department. (On the issue of a revised prospectus, it would be well to define the qualifications required. The wording of the present prospectus, "properly qualified candidates," though it may be seen to refer to qualifications for *each* of the previously mentioned Departments, generally leaves intending applicants much in the dark, and occasions much extra correspondence.)

The augmentation (which continues) of these classes, and particularly the unavoidable circumstance abovementioned, viz., their *individual* instead of collective instruction, has entailed an increased amount of labour on both the Principal and the Head Master. As it is understood, that measures are in contemplation for an increase to

the Preceptive Establishment, I need not here do more than thus simply advert to the urgent necessity for it.

The following numerical statement will give a view of the present condition of each Department, and its past results.

March 31*st* 1852.	1*st Department.*	2*nd Department.*	3*rd Department, Senior Division.*	3*rd Department, Junior Division.*	*Non-Stipendiary,* 1*st grade.*	2*nd Ditto.*	*Total.*
No. present at this date,--	1	15	7	19	6	8	56
Total number of students up to this date, -- --	5	56	10	59	10	11	151
No. of applications for admission up to this date,	17	129	not recorded.				
No. furnished by the College to various departments of the public service up to this date,	4	34	3	26	4	1	72

The 72 appointments were,—

1 Sub-Assistant Grand Trigonometrical Survey.
3 Sub-Assistant Civil Engineers.
3 Sub-Assistant Revenue Surveyors.
32 European Assistant Overseers.
1 European Superintendent of Roads (afterwards appointed teacher of Drawing and Surveying, Agra College.)
1 Native Superintendent of Roads.
1 Pergunnah Visitor of Schools.
3 Native Draftsmen.
24 Native Surveyors.
2 Assistant Executive Officers, Punjab Canal Department.
1 Probationary Ditto, Ganges Canal.

An outline of all the courses of study in all the Departments for the past year, is given in the Appendix.

The course was not entirely completed during the year in any of the Department. In the second, in which alone it is supposed to represent a single year's course, it would have been completed had the date of joining been, as it is intended uniformly to be, the 1st Janu-

ary and not the 15th. The courses here sketched out have been considerably amended since the first year, and may be further altered and improved as better books on the various subjects become available.

A list of the subjects prescribed for competition for prizes, and a list of the successful competitors will be found in the Appendix. The Exercises and Drawings were examined by different Officers at Roorkee and the neighbourhood, who kindly undertook at my request to decide on their merits.

An endeavour was made during the past year to introduce modelling in sand of various earthwork constructions, and a set of tools was made up in the Roorkee workshops for the purpose. None of the kinds of sand obtained having been found suitable, the modelling has for the present been abandoned. It would, I think, be found a useful exercise.

The students of all the Departments have been employed in the morning hours, on prescribed days, in surveying and in visiting the works in the neighbourhood. On one morning in each week, the drawing class is open for perspective and pencil sketching. The students have also practised sketching from nature, and several very creditable specimens have been produced.

A few lectures, introductory to a course of chemistry, were delivered towards the close of last session by Dr. K. Burr, Civil Surgeon at Roorkee. The materials and other necessary preparations are as yet too incomplete for an extended course; for which such provision may now be made as the deficiencies experienced in the recent lectures may have shown to be required. A brief course of lectures on Natural Philosophy was also delivered, illustrated by the apparatus belonging to the Ganges Canal Model Room. The lectures embraced a wider range than those of previous years, which had been confined to the subjects of mechanics, but from want of the time necessary for entering into details, they were, for the most part, only outlines or abstracts of the subjects treated.

A nucleus has, during the past year, been formed for the contemplated museum. The contributions consist chiefly of the following:

English and other fossils, and specimens of rocks, from Lieutenant Colonel Cautley.

Clays from Central India, and specimens of pottery made from them, from Captain Campbell, through Government, North Western Provinces.

Iron and copper ores and metal from Gurhwal, sent by the Assistant Commissioner, Sreenugger, at the instance of Lieutenant Colonel Cautley.

Mineralogical specimens, from the Reverend J. B. D'Aguilar.

Woods collected on the line of the Agra and Bombay Road, from Lieutenant Colonel Goodwyn.

In addition to the above, further contributions have been promised by Lieutenant Colonel Goodwyn, Captain A. Ramsay, and Doctor Hunter, Madras.

The museum of engineering materials, which may be made a most important means of instruction and body of reference, should, with this view, be arranged with great precision, and the specimens accompanied by a variety of useful details of localities where found, quantities there existing, uses to which there applied, places to which transported, and means of transport, specific gravity, quality as determined by analysis or by mechanical experiment, &c. &c. and, where possible, in the case of clays, metals, &c., with specimens of articles manufactured from them. With reference to details of quality of materials, I would observe, that the Roorkee workshops offer great facilities for conducting accurate experiments on the strength of woods, stones, &c., which experiments might be conducted at stated times by the College masters and students, and by persons attached to the workshops in concert, and for this purpose, it is desirable that in all cases, where practicable, specimens sufficient for such experiments, as well as for deposit in the museum, should be procured. The conducting of such experiments would be a valuable exercise to the College students, as cultivating habits of minute accuracy, close and patient investigation, and careful and methodical registration of observed results; and the value of the records so obtained, regarding Indian materials, on which the existing information is so scanty, would be, I believe, unquestionable.

An addition has been made to the instruments provided for instruction in surveying, of two theodolites, of the ordinary construction, one 5-inch and one 4-inch. They were procured from England for the College. Cases of drawing instruments also have been procured for the supply of the College students, and a demand has arisen for them from without, which, as far as possible, it has been endeavoured to meet.

In concluding this report of the Institution, which I am now leaving, I have only further to add, that from the several masters, each so far as he was enabled, I have continued to receive the aid that was required for carrying out the details of the several measures proposed, and of the course of instruction adopted.

AJMERE SCHOOL.

1st Year.

LOCAL COMMITTEE OF PUBLIC INSTRUCTION AT AJMERE, AS ON THE 1ST AUGUST 1851.

Names.	Designation of Office.
Col. T. Low, C. B., President, --	Agent Governor General.
Lieut.-Col. C. T. Dixon, ------	Supdt. of Ajmere and Mairwara.
Lieut. P. A. P. Bouverie, ------	First Asst. to the Superintendent.
R. A. Macaulay, Esq., M. D., ----	Civil Surgeon.
Moulvee Mujeed-ood-Deen, ------	Senior Sudder Ameen.
C. Buch, Esq., Ph. D., --------	Secretary.

This Institution was only opened on the 19th of May 1851, and indeed, as the payment of monthly fees was not enforced till the 11th June, its actual establishment must be considered to date more properly from the later period. It has had some peculiar difficulties to contend with, amongst which may be mentioned, the prejudice against fees engendered by the recollection that the two former Government Schools were free, and the great difficulty in obtaining school books.

Still, however, the experiment must be considered to be entirely successful, and its prospects for the future highly encouraging.

Moonshee Meer Ali Nuqi having been found not altogether equal to his duties as 2nd Persian and Oordoo Teacher, the Moonshee Sheik Niyamut-oollah, who had for many years kept a Persian School in Ajmere, was substituted for him in the month of July.

Detailed Statement of Salaries and Establishment of the Ajmere School.

Department and date of Government Order constituting each Office Establishment existing on the 1st May 1852.	*Date of the appointment of the individual holding Office.*	*Name of the individual.*	*Description of service.*	*Amount of salary per mensem.*	TOTAL.
				Co.'s Rs.	Co.'s Rs.
General Department,	11th February 1851,	C. Buch, Esq., Ph. D.	Superintendent, ...	400 0 0	
		Ditto, Ditto, ...	House-rent, ...	50 0 0	
25th March 1851, ..	25th March 1851, ..	Mr. G. Wiggins, ...	First Master, ...	250 0 0	
5th June 1851,.. ..	25th March 1851, ..	Sookhdev Buksh, ...	2nd ditto, ...	80 0 0	
26th September 1851,	25th March 1851, ..	Ramachurn Mookerjee, ...	First Assistant Junior Teacher, ..	20 0 0	
	1st October 1851, ..	John Trilocke,..	2nd ditto ditto ditto, ...	20 0 0	
	11th May 1851,.. ..	M. Mahomed Muzhur, ...	Head Persian and Ordoo Teacher,..	40 0 0	
	1st August 1851, ..	M. Sheikh Neeamut-oollah, ..	2nd ditto ditto ditto, ...	26 0 0	
	1st October 1851, ..	M. Mahomed Muveer, ...	3rd ditto ditto ditto, ...	20 0 0	
	4th April 1851,.. ..	P. Devadutta Tevaree, ...	Head Sanscrit and Hindee Teacher,	40 0 0	
	4th April 1851,.. ..	P. Rushuk Loll, ...	2nd ditto ditto ditto, ...	26 0 0	
	1st October 1851, ..	P. Mungul Dutt, ...	3rd ditto ditto ditto, ...	16 0 0	
		ESTABLISHMENT.			
			Petty Contingencies.	12 0 0	
			2 Chuprasees, at 5 Rs. each,.. ..	10 0 0	
			1 Brahman, ...	5 0 0	
			1 Furrash, ...	4 0 0	
			1 Chowkeedar, ...	4 0 0	
			1 Sweeper, ...	3 0 0	
			English Scholarship, ...	40 0 0	
		Joogul Kishore, ...	Pergh. Visitor, Ajmere & Mairwara,	30 0 0	
		9 Village School Teachers, including House-rent, &c.,	.. ..	44 0 0	
					1140 0 0

The report of the Superintendent states:

"Since the 1st June no less than 360 scholars have been admitted, many of whom, it is true, have left after one or two months. But the number of those who regularly attend, amounts now to upwards of 260, and there is every reason to expect, that it will greatly increase in the course of the present year. This constant admission of new scholars, which cannot be prevented in a newly established Institution, is a great obstacle to an efficient system of teaching, and places the teachers in a most disadvantageous position as compared with those of the older Colleges. As regards the selection of well qualified teachers, the Superintendent has peculiar pleasure in bearing testimony to the very satisfactory manner in which most of his subordinates have discharged their duties. But he takes at the same time the liberty of mentioning the dismissal of the 2nd Persian teacher, after a few months' trial, as one of the difficulties which the new Institution encountered."

The following will show the distribution of the scholars as to studies, religion, &c. The proportion of Mahomedans is, it will be observed, very large.

Statement of the Number, Caste, &c., of the Students of the Ajmere Institution, on 1st March 1852.

Statement showing the number of students who pay or who do not pay, and the amount realized.			*Statement showing the number of students studying each of the languages taught on the 1st March 1852.*								*Statement showing the number and caste of students on the 1st March 1852.*							
Non-paying.	Paying.	Amount realized from 1st June 1851 to 29th February 1852.	English.				Persian and Oordoo.	Sanskrit and Hindee.	Hindee.	Total.	Christians.	Mahomedans.	Hindoos.					Total.
			English and Persian.	English and Hindee.	English only.	Total.							Brahmins.	Kaiths.	Buneeahs.	Other castes.	Total.	
		Rs. A. P.																
29	241	241 0 0	56	15	13	84	108	32	46	270	0	65	61	45	60	39	205	270

The first annual examination of the Ajmere Institution took place on the 15th December 1851, and the following days, with the excep-

tion of the first English class, which was not examined till the arrival of Colonel Low, C. B., in the earlier part of January 1852.

The examination of the English Department was conducted by Colonel Low, C. B., President of the Local Committee of Public Instruction; Lieutenant B. P. Lloyd, Assistant to the Superintendent of Ajmere and Mairwara, and Member of the Committee; Lieutenant A. M. Murray, Deputy Commissary of Ordnance; the Superintendent of the School, and Mr. Wiggins, 1st Master. In the examination of the Vernacular Departments, the Superintendent was assisted by the Principal Sudder Ameen, Member of the Local Committee, the head Persian and Oordoo, and the head Sanscrit and Hindee teachers.

The scholars of the first English class were examined in Marshman's Brief Survey of History, part I. pages 1 to 60; Prose Reader No. IV. the greater part; Poetic Reader No. I. about 30 pages; translation from English into Oordoo and Hindee, and from Oordoo into English, (Oordoo Reader No. I.); Geography (Introductory part, Geography of Asia and Hindoostan), and in Arithmetic (as far as Simple Proportion). Colonel Low's opinion on the proficiency of the scholars is expressed as follows: "I this day examined the 1st English class at the Government School here, and it gave me much satisfaction to be able to express, as I did verbally to the youths composing that class, the very favourable impression of their merits that was made on my mind by that examination. I examined the boys carefully and minutely first in their Reading, Spelling and Parsing; and subsequently they were questioned fully in General History and Geography; and considering that they have only enjoyed the advantage of this Institution for about seven months, I was very agreeably surprised at the extent of their acquirements. I was particularly struck with the accuracy of their Spelling and Parsing; and their general knowledge of Geography and History, though not to my mind so surprising, as their skill in Parsing any English sentence, was nevertheless highly creditable both to the scholars and their teachers."

On the 11th January, the Superintendent examined the boys in Prose Reader No. IV., in Grammar and Geography; he had much pleasure in concurring in the above favourable remarks. In Arithmetic, the boys had to solve eight problems in compound Addition, Subtraction, Multiplication and Division, and in Simple Proportion. The answers of three scholars were perfectly correct; two made one slight mistakes, and the answers of other boys were satisfactory. It ought to be stated, that most of the boys on entering the school were almost wholly unacquainted with Arithmetic.

The scholars of the 2nd English class were examined by Messrs. Lloyd and Murray in English Reader No. I. (nearly the whole), Reader No. II. 40 pages, Grammar and Geography, and by the Super-

intendent in Arithmetic. The majority of the boys of this class knew little beyond the letters of the English Alphabet, when they were admitted. The examiners have expressed themselves as follows:

"The boys were examined by us one by one, and we are of opinion, that considering the short time the school has been established, the progress they have made is highly creditable to them, and to all concerned in instructing them.

"The whole of the boys read remarkably well, and with one or two exceptions, understood very well what they read. The examination in Spelling was very good, and the Pronunciation generally correct."

In Arithmetic, the boys have gone as far as Compound Subtraction, though not one of them was acquainted with Numeration on entering the school. One of the scholars solved all the Exercises correctly.

The 3rd and 4th English classes are composed of those scholars who have been admitted during the last three or four months. They were examined by Mr. Wiggins in Spelling, Reader No. I., and Numeration. Mr. Wiggins reported very favourably on the progress the boys had made.

The three Persian classes were examined by the Principal Sudder Ameen, the Superintendent of the School, and the head Persian and Oordoo Teacher. In the *first* Persian class, five boys have read a considerable portion of Sekundernamah, about one-half of the first book of Euclid, Arithmetic as far as Simple Proportion, and Oordoo (Reader No. III.); about eight or ten boys have read Alum Giri, whilst the rest have been reading Gulistan. They were required first to translate a portion (about one page) of each of the above text books, which was dictated to them, into Oordoo, and an equal portion of Oordoo (from Reader No. III.) into Persian. In Geometry, they had to prove two propositions (Eucl. B. I.), and in Arithmetic they had to solve problems in Multiplication, Division and Proportion. They were further examined by the Principal Sudder Ameen and the Superintendent in the above text books and in Oordoo. The following is the report of the Principal Sudder Ameen on the progress made by the scholars of the first Persian class.

"On the 18th December 1851, I examined the first Persian class in Sekundernamah, Rookat Alum Giri, and Gulistan, in the presence of the Superintendent of the School, and was much gratified with the reading and explanation given by the youths. The correct pronunciation of the boys leads me to report, that great pains have been taken by the first Moulvee, as well as by the Superintendent of the School; for at Ajmere, where the Mairwarec language prevails, it is very difficult to teach a correct pronunciation of the Persian language,

I hope that after a short time the boys will have no difficulty in writing and pronouncing correctly. The text books of the first Division of the first Persian class are Sekundernamah, Euclid, Arithmetic and Oordoo, and the progress made by the pupils is highly creditable to the senior Moulvee. On the whole it may be said, that both the teachers and the Superintendent of the School have been working very hard, and a considerable advance has been observed in the Institution. I do not think that the inhabitants of Ajmere have any idea of the rules introduced in the school; it is in consequence of their introduction, that the boys have done so much within a short time. I hope that this rapid progress will induce all the native gentlemen of Ajmere to send their children to the school. As the Institution is placed in the midst of Rajpootanah, I think that whenever the people shall perceive the advantages resulting from learning, numbers will resort from the neighbouring States to the Ajmere school."

The 2nd and 3rd Persian classes were examined by the Superintendent, and the head Persian and Oordoo teacher. The scholars of the second class have read Bostan, Dustoor Soobian, Nuqliat, and Madho Ram; two or three months ago, they also commenced Oordoo, at the instance of the Superintendent. Some of the boys have read nearly the whole of Oordoo Reader No. I. The scholars of the 3rd class have read Dustoor Soobian, Mahmudnamah, and Karimah. At the examination, the reading, translation, and explanation of a large proportion of the boys were very satisfactory, and showed that the 2nd and 3rd Moulvees are painstaking and efficient teachers.

The pupils of the first Sanscrit and Hindee class have read portions of Sidhant Kamudi, Laghu Kamudi, Raghwans, and Lilavati; in Hindee their text books have been Ramayan and Prem Sagur. The Sanscrit examination was conducted by the Head Pundit, who reports very favourably on the general proficiency of the scholars. In Hindee they were examined by the Superintendent, who has much pleasure in bearing testimony to the very creditable progress some of the boys have made since the opening of the Institution. Several of the scholars have read the whole of Prem Sagur, and appeared to be well acquainted with almost every part of it. Four or five scholars of this class are very promising boys. The Superintendent is happy to add, that almost all the pupils have expressed their willingness to learn English.

The following is a list of the scholarshipholders:

I.—English Department.

	Rs.	A.	P.
1. Radha Bullub, -- -- --	6	0	0
2. Muhomed Buksh, -- -- --	5	0	0
3. Luchmun Dass, -- -- --	5	0	0
4. Choga Lall, -- -- --	4	0	0

II.—PERSIAN DEPARTMENT.

	Rs.	A.	P.
1. Alif Khan, -- -- --	5	0	0
2. Jumal-ood-Deen, -- -- --	5	0	0

III.—SANSCRIT DEPARTMENT.

1. Ram Roop Misr, -- -- --	5	0	0
2. Sheonarain, -- -- --	5	0	0

Subsequently to this report, the Superintendent drew the attention of Government to three points, which he considered of importance, 1st, some desire having been expressed both by senior pupils as well as by certain native gentlemen, that Arabic should be taught, it seemed desirable that a separate Arabic class should be formed; 2nd, that as a general feeling prevailed amongst the Brahmins opposed to the payment of fees for instruction in Sanscrit, that perhaps the paying system might with propriety be waived in this Department; 3rd, that Pohkur appeared to be a highly eligible place for the establishment of a branch Sanscrit school, a large number of Brahmins being attracted by the shrines of that place, who would benefit by such an Institution.

This latter proposal was viewed by the Lieutenant Governor, in reply, favourably, but he recommended that the payment of fees should be an indispensible condition of the establishment of this auxiliary school. He did not think the exemption of the Brahmins in the Sanscrit Department from fees would be a good precedent, and that rather, on the other hand, it would tend to excite undesirable jealousies.

Considering that the study of Arabic offered a wide field for intellectual improvement, and the acquisition of knowledge, he approved the idea of an Arabic class, and wanted only the assurance of the Committee that prospects were sufficiently encouraging to sanction its establishment under a separate teacher.

The following paragraph from the orders of Government, in reply to the Annual Report, may form a suitable conclusion to the notice of this school.

"The degree of success which has already attended your "efforts, is gratifying, and gives promise that the school will prove of "extensive benefit to Ajmere and the surrounding districts."

SAUGOR SCHOOL.

LOCAL COMMITTEE.

NAMES.	DESIGNATION AND OFFICE.
Captain A. Skene, B. N. I., --	Deputy Commissioner, 1st Class.
Lieutenant F. D. Gordon, M. N. I.,	Do. 3rd do., and Secy. L. C. P. I.
Moulvee Syud Ali Hussain, --	Sudder Ameen.
Moulvee Mohammed Hadee Ali, --	Moonsiff.
Rao Anunt Rao Bhya Sahib, --	Teekadar of Jysing Nagar and Honorary Member.

The school continued divided into three Departments, viz., English, Hindee, and Oordoo, with a Persian paying class.

The total number of students in each Department was as follows:

English Department, -- -- -- --	66
Hindee Department, -- -- -- --	86
Oordoo Department, -- -- -- --	58
Persian Paying class, -- -- -- --	46
Total, -- -- -- --	256

But 256 was not the actual number on the rolls of the Institution. The 46 who read in the Persian paying class, were from amongst those students whose names were already on the rolls of the other Departments in the following proportion, viz., 28 from the Oordoo Department, 13 from the English Department, and 5 from the Hindee Department. Deducting these 46 therefore from the above total, there remained 210 as the actual number on the rolls at the close of the year under review, being in excess of the regulated number 200.

The number of pupils paying a schooling fee was 93.

The only change that had taken place in the Institution during the past year, was the important one of the introduction of schooling fees into the English Department, in July last. The boys who left the school on this account were only 12. Their places had been nearly filled up; for the Department numbered 69 boys then, and there were present at the examination 68, only one boy less. Though the paying system has not produced all the good anticipated, still it was a

step in the right direction, and must ultimately do good, if the people really appreciate English instruction.

The receipts realized from all sources during the year had been,

		Rs.	A.	P.
English Department,	Entrance Fees, -- -- --	40	0	0
	Tuition Fees, -- -- --	169	0	0
Hindee Department,	Entrance Fees, -- -- --	12	0	0
Oordoo Department,	Entrance Fees, -- -- --	15	8	0
Persian Class, Tuition Fees, -- -- -- -- --		116	10	9
	Total Rs. --	353	14	9

With reference to the remarks made in last year's report, regarding the withdrawal from the school of several boys of the Pundit caste, consequent on the admission of a chumar, this feeling has, it is believed, expired, and seeing that the Committee were determined not to yield to any such prejudices of caste, some of the boys at that time removed have since returned to the school; among others, a near relative of the Rajah of Jysing Nagar, who is one of the School Committee, and who took a prominent part in the opposition made to the admission of the chumar.

Establishment as on the 30th April 1852.

Names.	Designation.	Salary.	Date of appointment.	Remarks.
English Department.				
James Rae, ..	Head Master, ..	300 0 0	12th June 1837.	
W. H. Bachman, ..	2nd Ditto, ...	* 200 0 0	11th May 1846.	
Khooman Singh,	Joint Librarians, ..	10 0 0	29th October 1850.	
Juwahir Lall, ..			1st January 1851.	
Hindee.				
Behary Prohit, ..	1st Teacher, ..	25 0 0	15th March 1842.	
Kuniram, ...	2nd Ditto, ...	20 0 0	17th April 1847.	
Bholae, ...	3rd Ditto, ...	15 0 0	15th March 1842.	
Duryao Sing, ..	4th Ditto, ...	15 0 0	18th March 1850,	Acting.
Girdhary Lall, ..	5th Ditto, ...	15 0 0	1st January 1851,	Acting.
Muharaj Singh, ..	Assistant Monitor,	5 0 0	18th March 1850,	Acting.
Kunhya Lall, ..	Monitor, ...	2 8 0	16th Nov. 1846.	
Ram Chund, ..	Ditto, ...	2 8 0	1st May 1848.	
Oordoo.				
Ghoolam Russool,	1st Moulvee, ..	25 0 0	27th October 1843.	
Abdool Sulam, ..	2nd Ditto, ...	50 0 0	1st March 1847.	
Immad-ood-deen, ..	Persian Teacher, ..	† 8 0 0	15th May 1815.	
Bhowanipurshad, ..	Monitor, ...	† 2 0 0	16th May 1848.	
Servants, ..	1st Bearer, ...	4 8 0	15th March 1842.	
	2nd Ditto, ...	3 0 0	Ditto ditto.	
	Bhistee, ...	2 0 0	Ditto ditto.	
	Peon, ...	3 0 0	Ditto ditto.	

* Personal allowance: authorized allowance for 2nd Master Rs. 80 per mensem.
† Paid from Tuition Fees.

Statement exhibiting the Number, Caste, &c., of the pupils in the several Departments of the Saugor Government School, as on the 30th April 1852.

English Department.			Hindee Department.			Oordoo Department.			Total.			Total of all Castes.
Christians.	Hindoos.	Moosulmans.	Christians.	Hindoos.	Moosulmans.	Christians.	Hindoos.	Moosulmans.	Christians.	Hindoos.	Moosulmans.	
21	50	2	0	74	4	0	54	24	21	178	30	229

Statement exhibiting the number of Paying and Non-paying Pupils, in the several Departments of the Saugor Government Schools, as on the 30th April 1852.

English Department.		Hindee Department.		Oordoo Department.		Persian Department.		Total.		Remarks.
Paying.	Non-paying.	Paying.	Non-paying.	Paying.	Non-paying.	Paying.	Non-paying.	Paying.	Non-paying.	
65	8	0	78	0	78	44	0	109	164	The number 44 entered as paying in the Persian Department is included in the number 164 non-paying in the Total.

List of Scholarship in the Saugor Government School for the year.

Junior Scholarship (1), ...	8	Vacant.

Local Receipts and Disbursements of the Saugor Government School, during the official year 1851-52.

Resources of Income.									
Separate Funds.	*Assignment from Parliamentary grant.*	Total.	*Assignment from additional grant.*	*Establishment and expenses as fixed by Government, dated 23rd January 1841.*	*Tuition fees.*	*Grand Total of Receipts.*	*Nature of Charges.*	Items.	Total.
								Rs. A. P.	
							English Teacher, ..	6000 0 0	
							Librarian,.....	120 0 0	
							Vernacular teachers,	1200 0 0	
							Establishment, . ..	144 0 0	
	4776	4776	2364	7140	418 13 0	7858 13 0	Junior Scholar, ...	0 0 0	
							Contingencies, ...	164 15 3	
							Prizes, ...	96 0 0	
							Oordoo and Persian Teacher, ...	1026 0 0	8750 15 3
Establishment.	Contingencies.	Prizes.	Junior Scholar.				Grand Total. ..		
8490	164 15 3	96	0				8750 15 3		

The English Department was divided into five classes. The 1st class in two divisions contained eleven pupils, the 2nd, fifteen, the 3rd, eighteen, the 4th, thirteen, and the 5th, eleven boys. The text books of all the class will be found in the precis of studies.

The examination of the first English class was undertaken by Captain Burton, Deputy Judge Advocate General, at the request of the Committee, that of the remaining English classes by Lieut. F. D. Gordon, Secretary to the Committee.

The following extract from Captain Burton's minute, will show the result of the examination of the senior classes, as well as the opinion entertained by him of the causes which tended to discourage the pupils from prosecuting with vigour their English studies.

"The subjects to which my attention was directed were Reading, Explanation, History, Poetry, Grammar, Writing from Dictation, Geography, Geometry, Algebra, Arithmetic, Mensuration, Trigonometry, Composition, Translation, Mapping and Writing.

"Without entering into the details of the examination, which embraced all the subjects above enumerated to the extent which each pupil was declared to have advanced, for the class embraces different grades, the general impression left on my mind is that the acquirements of the scholars want solidity, most of them have some acquaintance with all the branches of study included in the precis, but it is superficial, with one or two exceptions, which I will particularize. It is evident from the system pursued that their instructor is at pains to make his pupils comprehend what they learn, but they, in their haste to advance, neglect to carry with them the knowledge they have already acquired, and are consequently unable to reply to easy questions on points which have not immediately engaged their attention, though they must have been well acquainted with them at an earlier period of their studies. This was especially exhibited as regards facts, in History and Geography, and as regards application in their very defective Grammar, in Composition and Translation.

"In Geometry, the four pupils, Girdharee Lall, Khooman Singh, Juwahir Lall and Beeharee Lall, show much proficiency, as also in Algebra, Arithmetic and Mensuration, the first two have made satisfactory progress in Plane Trigonometry, especially Girdharee Lall, who is altogether a better scholar than Khooman Singh, whose weak health may however account for his inferiority. Khooman Singh excels in Mapping and Writing, and his Composition is better than Girdharee's, whose deficiencies in this essential point were very striking. Benniti Bhuett was very quick in his translation, and expressed in English very happily the meaning of the original.

"For several months, Girdharee Lall and Khooman Singh have attended usually once a week at my house for instruction in practical Surveying, and they have made some little progress in this branch of study, but a listlessness and want of energy and interest, characterises their proceedings, which is very discouraging, and if this be so in a voluntary study, how much more must it be in their routine tasks.

"I am of opinion that the studies of the past year have taken too extended a range; that Poetry, Mensuration and Trigonometry should be excluded from the precis for the ensuing year, and that attention shonld be given to making the scholars thorough masters of what they have already studied rather than to any attempt at further advance, but I cannot avoid the conclusion that a stimulus is required in the school, beyond the dim and distant prospect of finding knowledge conducive to advancement in after life. At the Presidencies, or at very large stations, where numerous office establishments invite candidates for promotion to lucrative posts, the sight of their school predecessor's advancement may be found sufficient to

stimulate the exertions of present students; but where the only public office is a small cutcherry, in which vacancies are few and far between, and those only to posts not offering much scope for the exercise of talent or the display of acquirements, some immediate source of emulation seems to be required, perhaps minor scholarships of seven or eight rupees monthly, and class monitorships of two or three rupees, to be competed for yearly."

The same sentiments were expressed by Lieutenant F. D. Gordon, Secretary Local Committee Public Instruction, in his letter to Government, transmitting the annual report, in the following terms:

"There is, however, another great drawback to the Saugor School, which is that the boys do not remain sufficiently long to be able to derive any permanent or solid advantage from their English studies, nor is there any sufficient reward, or prospect of bettering themselves in a worldly point of view, by a thorough knowledge of the English language held out to them.

"Without the prospect of some substantial benefit or return for the outlay of time, perseverance, and capital, it is very difficult to expect a native to continue his studies for any length of time, consequently the boys, without one exception, merely acquire a smattering sufficient in their own opinion to justify them in putting forward their claims for appointments, whether qualified in other respects to hold the same or not. A remedy for this is alluded to in Captain Burton's Minute on the 1st English class, and the subject of granting Junior scholarships has, I believe, been so fully entered into before by Captain Elliot, formerly Deputy Commissioner of Saugor, that for me to say more at the present time than again to bring the subject to your notice, for the favourable consideration of Government would, I consider, be superfluous."

To these suggestions, the Lieutenant Governor replied in the following terms: "Both the Head Master's report, and the reports of the Examiners, show that there is a want of spirit and energy among the students, and that few of them remain long enough in the school to derive much advantage from their English studies. This is ascribed to the local position of the school, where there are few posts to which a knowledge of English would serve as an introduction. Captain Burton, in his Minute on the examination of the 1st class, proposes to remedy this by offering small scholarships of 7 or 8 rupees monthly, and class monitorships of 2 or 3 rupees, to be competed for yearly. It is to be remarked on this proposal, that there is one scholarship of 8 rupees already attached to the school, which none of the pupils have been sufficiently advanced to gain. There will be no use therefore in granting more, unless they are to be given at first without reference to actual attainments. The

Committee are requested to consider the question in this point of view, and, if necessary, to express further their sentiments upon it."

The Oordoo Department had 58 boys, 56 at the time of the examination, and 2 admitted on the 24th December 1851, this showed an increase on last year's attendance of 19 boys; besides the above, there were 46 reading in the Persian paying class. This showed an increase of 10 on last year. The above facts, taken into consideration with the circumstance of the withdrawal of so many boys of the Pundit caste last year on account of the chumar boy, speaks very highly for the estimation in which this Department is held by the community; the whole credit being due to the excellent men Goolam Russool and Abdool Salamat, the heads of the Department.

Captain Skene, Deputy Commissioner, aided by the Sudder Ameen and Moonsiff of Saugor, examined this Department.

The following encouraging report by Captain Skene, of the result of the examination, will be read with interest:

"I superintended the examination of the Senior classes in the Oordoo and Persian Departments of the school, with the assistance of the Sudder Ameen and Moonsiff of Saugor, both of whom had superintended the examination of the same departments last year.

"I may premise my own remarks by stating, that both the above very competent judges are of opinion, that a satisfactory amount of progress has been made by the boys generally during the past year.

"The Oordoo Department is divided into five, and the Persian into four classes, but I was able to attend the examination of the three senior only.

"The branches studied in the three senior classes comprise both Literature and Science in Oordoo, and the first only in Persian.

"The two senior boys of the 1st class in both departments are considerably further advanced, and more proficient in their studies generally than the others; they are monitors in the class, and in this capacity assist in the instruction of the juniors; from their superior qualifications, they ought to be in a separate class.

"From their answers in Astronomy and Mechanics, the boys* appear to comprehend the subjects studied, but as few of them are likely to remain long enough at school to obtain any thing beyond a slight acquaintance with the mere elements of these sciences, it may be questioned, whether their time could not be more profitably employed in studies of a more practically useful nature.

* 1st and 2nd Class.

"The three classes passed a fair examination in Geography as far as being acquainted with the names, and positions on the map of the principal towns, rivers, seas, &c., of the countries, principally in Asia, regarding which they were questioned, and the two seniors of the 1st class added to this an acquaintance with the subject of latitudes and longitude not possessed by the others.

"The sums in Arithmetic given to the 1st class by the Examiners were not difficult, and generally they were worked on the slate speedily and correctly; some failed in sums in the Rule of Three and Extraction of the Square Root, but on the whole the examination was satisfactory.

"In Geometry, I do not consider the examination* satisfactory; all the boys possess about the same parrot-like acquaintance with the propositions set before them, but they have not a thorough knowledge of the first principles of the Science; they require in fact to be more thoroughly grounded in the axioms, postulates, &c., than they have been, and to have the successive steps of each demonstration more fully explained to them.

* 1st Class.

"Great care has evidently been bestowed in teaching the boys of these classes the rules of Grammar, they went through the inflections of the verb, and answered questions regarding the government and concord of words in the sentences they had read, with great fluency and correctness.

"The examination of the 2nd class in Arithmetic was less satisfactory than that of either the 1st or 3rd; many blunders were made in working very simple sums in Multiplication and Division, the backwardness of the boys in Arithmetic must be impressed upon the Moulvies during the coming year; it is certainly the least creditable to them of the various branches studied under their instructions.

"In the Reading and Explanation of both Oordoo and Persian Prose and Poetry, these classes may be said to have passed an excellent examination; generally speaking, the boys read clearly and with emphasis on the proper words, indicating that they comprehend what they are reading; their pronunciation too is generally good, and evidently carefully attended to.

"I was much pleased with their general proficiency in this branch of their studies.

"In Composition, both in Oordoo and Persian, the 1st and 2nd classes generally acquitted themselves respectably; they composed

short Essays in a manner clearly evincing, both from the general correctness of their diction, and the ideas expressed in them, that they are carefully exercised in this important branch of their studies.

"The written translations from Persian into Oordoo and from Oordoo into Persian were also on the whole respectably executed, many of them were perfectly correct grammatically, and some expressed with considerable elegance.

"The hand-writing of the boys in the first three classes is generally good, and evinces great care on the part of the teachers.

"The comparatively recent introduction of the study of scientific subjects into these classes account for their present somewhat elementary nature; it remains to be seen from the progress made in another year whether the tastes and leisure of the boys will induce or admit of their pursuing them for a sufficient length of time to acquire an amount of knowledge to be of practical utility.

"The examination passed by the boys in the Literary Department may, I think, be fairly pronounced highly satisfactory, and I am of opinion, that the state of these classes generally, reflects much credit upon the teachers, Moulvies Abdul Salam and Gholam Rusool."

The Hindee Department numbered 86 students, 83 on the rolls at the examination, and 3 admitted after, on the 20th December. This number was divided into 5 classes, each under a separate Gooroo, assisted by one assistant teacher and one monitor. This was 9 less than last year.

The first class numbered 13 boys under Behari. The 2nd class 8 boys, under Kunvir Ram. The 3rd class, 12 boys, under Bholi Gooroo. The 4th class, 17 boys, under Duryeo, and the 5th class, 33 boys, in three divisions, under Girdhari.

The precis of studies will show the books, &c., read in each class in this Department. The decrease in this Department on last year's attendance was 9 boys. In the Head Master's opinion, the paucity of numbers in this Department was to be attributed to the necessity of each boy on admission being able to read the Neti Kutha. This acted as a bar to an increase, for many boys applied to be admitted, but were rejected, because they were unable to read the above-named book; another reason might have been that the Oordoo language was found of greater use than the Hindee, in facilitating their means of getting employment in the public service.

Lieutenant F. D. Gordon, Secretary Local Committee Public Instruction, speaks of this Department in the following terms:

2nd Sanscrit Class, 2nd Division, 5 Pupils.

1. Mudh Kaumudie, ten goon.
2. Ummur Kosh, 1st chapter.

3rd Sanscrit Class, 9 Pupils.

1. Singh Mudh Kaumudie, 54 pages.
2. Hitopdesh, 44 pages.
3. Moofeed Soobeean, 50 pages.

SCIENCE.

1st Class, 2 Pupils.

1. Integral Calculus, from pages 363 to 393. Double Integral, Bouchurlal's Integration of 2 Variables, conditions of integrality and homage.
2. Revision of Wand's Algebraical Geometry, to pages 142; to be read Parabola, Sections of the Cone and descriptions of the Conic Sections by continued motion; Brinkley's Astronomy to page 114.

2nd Class, 11 Pupils.

1. Differential Calculus, to page 100, Bouchurlal.
2. Wand's Algebraical Geometry to page 66.
3. Young's Mechanics, to page 82.

3rd Class, 6 Pupils.

1. Hutton's Conic Sections.
2. Ditto Spherical Trigonometry.
3. Ditto Statics.
4. Small Oordoo Algebra, the whole.

4th Class, 10 Pupils.

1. Hutton's Plane Trigonometry.
2. Small Oordoo Algebra, to Application of Algebra to Geometry.
3. History of the Moghuls.

5th Class, 7 Pupils.

1. Euclid, 11th and 12th Books.
2. Algebra, to Simple Equations.
3. History of Bengal.

6th Class, 28 Pupils.

1. Euclid, 2nd and 3rd Books.
2. Arithmetic, to Decimal Fractions.

7th and 8th Classes, 35 Pupils.

1. Book of Euclid, Arithmetic.

Course of Studies of the Senior English Department of the Benares College, during the Session 1852.

Class.	Literature.	Science.	Oriental.
1st Class, Senior Dept.	Johnson's Rambler, (whole of Volume I.). 1st 99 Nos. Shakespear's Macbeth (whole). Guizot's History of the English Revolution (whole). Hallam's Constitutional History of England, Charles I. and II.	Stewart's Philosophy of the Human Mind, Part I. Brinkley's Astronomy (whole) but the Appendix. Potter's Optics, Part I. (whole). Hind's Plane Trigonometry.	Secunder Nama, 1st 20 pages. Fasanai Ajaib, from page 3 to 150. Alif Kasrat (whole).
2nd Class, Senior Dept.	Moral Tales (Ency. Beng. No. X.) (whole). Poetical Reader No. III. Part II. Keightley's England. Crombie's Etymology and Syntax.	Chamber's Geometry, VI. and XI. Books. Wood's Algebra to the end of Qaudratic Equations. Arithmetic and Elements of the Theory of Numbers. Geography and Map Drawing.	Fasanai Ajaib, 1st 50 pages. Secunder Nama, 1st 10 pages. Hindee Hitopdesha, and First lessons of Sanscrit Grammar.
3rd Class, Senior Dept	Moral Tales (Ency. Beng.) No. X. (whole). Poetical Reader No. III. Part I. (whole). Keightley's England, Vol. I, 1st 82 pages.	Geometry, (C. E. C.) 1st 2 Books. Algebra to the end of Simple Equations. Arithmetic and Elements of the Theory of Numbers.	*1st Section.* Nauratan, 1st Chap. (whole). Gulistan. 8th Chap. (whole). *2nd Section.* Mufeedus Subian and Kurima. Hindee-Ramayana and Grammar.

Course of Studies of the Anglo-Sanskrit Class during the Session 1852.

Literature.	Science.
English Reader No. 5. Introduction to the Inductive Philosophy (from Mills).	Synopsis of Science, Dr. Ballantyne's, Vol. I. Sanscrit and English, pp. 103 and 131 (whole).

Course of Studies of the Arabic and Persian Departments of the Benares College, during the Session 1852.

Class.	Literature.	Science.
1st Arabic Class.	Hidaya, 3rd Volume to Kitab-us-shahadat. Dewan-i-Mutnabbi, from beginning to 300 pages. Mukhtasir Mâni, 1st Chapter. Nur-ul anwār (whole). Manhajus shafi (whole). Sharifi (whole). Sullam (whole). Tarikh-i-Taimuri, from 80th page to 200.	Geometry, 4th, 5th and 6th Books. Algebra, Quadratic Equations and Progression. Natural Philosophy, 1st 50 pages.
2nd Arabic Class.	Shareh Mullah to Marfooat. Shareh Tahzib (whole). Shareh Wáqáya, 1st Part. Nafhutul Yaman, 1st two Chapter. Serajee (whole).	Arithmetic, to the end of Simple Rule of Three. Algebra, Addition, Subtraction, Multiplication and Division. Geometry, 1st Book.
1st Persian Class.	Shafia, 1st 58 pages. Kafia to the end of Marfoat. Zuhury (whole). Qasaid Zahir Faryabi, 1st 50 pages. Mirat-ul Khayal, from 70th to 120th page. Atia Kubra (whole). Taqrib, (translation of Tahzib) (whole). Ajbul Ajab, 1st 40 pages.	Geometry, 1st three Books. Algebra to the end of Quadratic Equations. Miftah-ul Aflak, 1st six Books.
2nd Persian Class.	Madenul Fowaid, from the 16th letter to the end of the 50th letter. Naldaman, 1st 50 pages. Naho Mir and Surf Mir (whole). Shajratul Amani (whole).	Arithmetic, Compound Proportion and Vulgar and Decimal Fractions. Geography, Map of Europe. Geometry, 1st 16 Propositions of Book I.

ROORKEE COLLEGE.

Course of Study.

3rd Department.—Junior Division.

Practical Geometry, -- -- --	Adjoodhya Pershad's, chapters I., II., III.
Arithmetic, -- -- -- -- --	Ilm-i-hisab, Involution, Evolution, Logarithms.
Plane Geometry, -- -- -- --	Mumlook Ali's Euclid, 4 Books. Thomason's Euclid, books 5, 6.
Mensuration (lines and right-lined Planes).	Elliot's Mensuration, to p. 413.
Algebra, -- -- -- -- --	Ramchundra's Algebra, pp. 1—100, (Quad. Eq.) Ramchundra's, pp. 139—148, (Log).
Application of Algebra to Geometry.	Ramchundra's, pp. 169—188.
Elements of Plane Trigonometry.	Adjoodhya Pershad's, chapter V., (pp. 41—57). Ramchundra's Trigonometry, to p. 20.

Senior Division.

Solid Geometry, -- -- -- --	Mumlook Ali's Euclid, books 11, 12.
Mensuration, (Plane and Solid),	Elliot's Mensuration, p. 43 to the end.
Plane Trigonometry, -- -- --	Ramchundra's, pp. 21—29, (Analytical). 79—121 (Solution of Triangles).
Conic Sections, -- -- -- --	Ramchundra's, Parabola, the whole. Ellipse, 8 prop. Hyperbola, 5 ,,
Mechanics, -- -- -- -- --	Elements of Nat. Phil., pp. 1—56.
Materials and Construction, --	C. E. C. Papers, No. I. Abbott on Bridges, and Cautley on Well Foundations.
Measuring and Estimating.	
Strength of Materials, -- -- --	C. E. C. Papers, No. II.
Hydrostatics, Pneumatics, Hydraulics.	Weisbach's Hydrostatics, pp. 1—79, Hydrost. 80—146, Pneumatics. 147—162, Hydraulics. 163 to end, Heat, &c.
The Steam Engine, -- -- --	Perkins' Steam Engine.
Analytical Geometry, -- -- --	Ramchundra's, pp. 225—250.
Spherical Trigonometry, -- --	Ditto, 123—162.

Outlines of Astronomy, -- --	Elem. of Nat. Phil., pp. 37—118.
Principles of Geography, -- --	Hughes' Principles of Geography.
Outlines of Optics, Heat, Electricity, Galvanism.	Tresham's Blasting by Galvanism.

Civil Engineering College.

1st Department.

The following nine prizes are offered in the 1st Department: the examination of competitors to take place in the month of November.

1. For proficiency in applied Mathematics.

2. For acquaintance with works on Practical Engineering read in the class during the year.

3. Geodesy, knowledge of the principles combined with success in the field practice.

4. Written Essay on a subject to be given out on the 1st July. The Essay to be given in on 1st November.

5. Best Note Book with original Sketches, or Drawings from measurement of works in progress at Roorkee.

6. Private studies. (In a separate paper is given a list of books and portions of books recommended to be read).

7. Drawing.

The number of prizes is not limited to one for each of the above branches or subjects; more than one will be given when high proficiency is shown by others besides the most successful candidates. On the other hand, no prize will be given when no marked proficiency is shown by any of the competitors.

Course of Study.

1st Department.

Practical Trigonometry and Mensuration.	Galbraith, to p. 71. Ditto, pp. 180 to 190.
Mechanics, -- -- -- -- --	Weisbach, Vol. I. to p. 229, (Statics of Solids). 326 to 379, (Statics of Fluids).
Materials and their application, --	C. E. C. Papers No. I. Mahan, chapters 1, 2, 3. Blasting and Quarrying (Weale).
Strength of Materials and Stability of Structures; Construction.	C. E. C. Papers No. II. Weisbach, Vol. II. to p. 64, (and Appendix II.)

	Hosking's Building. Bonny's Carpentry. Tredgold. Mahan, chapters 4 and 6. Foundations (Weale). Abbott on Bridges, and Cautley on Well Foundations. C. E. C. Papers No. (Earthwork and Construction).
Measuring and Estimating.	
Outlines of Architecture, -- --	Hosking's Architecture.
Moving Powers and Machines, --	Weisbach, Vol. I. pp. 130 to 225
Interior Communication, -- --	Mahan, chapters 5 and 7. Roads (Weale). Wood on Railroads.
Practical Hydraulics, -- -- --	Weisbach, Vol. I. pp. 380 to the end. ——— Vol. II. pp. 108—381. Drainage of Lands, (Weale). Mahan, chapters 8, 9 and 10.
Principles of Geography and Geodesy.	Hughes. Galbraith, pp. 72 to 179.

Course of Study.

2nd Department.

Practical Geometry, -- -- --	Elliot's Geometry, (large type), to p. 106.
Algebra, -- -- -- -- --	Tate's Algebra, to p. 89.
Plane Geometry and Application of Algebra to Geometry.	Tate's Geometry, to p. 100. Hutton's Geometry, to p. 126.
Plane Trigonometry, -- -- --	Tate's Geometry, pp. 101 to 115. 133 to 138.
Mensuration, -- -- -- --	Elliot, (large type), to the end. Tate's Algebra, pp. 109 to the end. Tate's Geometry, &c., to the end.
Mechanics, -- -- -- -- --	Weale's Rudimentary Mechanics, to p. 85. p. 153 to the end.
Building Materials and Construction.	C. E. C. Papers No. 1. Weale's Volumes, Art of Building, Blasting and Quarrying Foundations. Abbott on Bridges and Cautley on Well Foundations. C. E. C. Papers No. IV. (Earthwork and Construction).

Measuring and Estimating.	
Strength of Materials, -- --	C. E. C. Papers No. II.
Interior Communication and Drainage. --	Weale's, Vol. Roads, Railways, Drainage of Lands.

Civil Engineering College.

1st Department.

Essay.

To be given in on or before 1st November 1851.

On the means of usefulness possessed by a native of Hindoostan, instructed to some extent in the science and practice of Engineering as now known in European countries; the mode in which he may best render serviceable to his own country and countrymen, as well as to the Government he may serve, the knowledge he has acquired or has within his reach; and the particular applications of Engineering art which may, with greatest facility and most general benefit, be introduced to the notice of the people of this country.

Civil Engineering College.

2nd Department.

The following prizes are offered in the 2nd Department, the examination of competitors to take place in the month of November.

1. For proficiency in Mathematics.
2. For proficiency in Surveying; knowledge of the principles combined with success in the field practice.
3. For acquaintance with the works on practical Engineering read in the class during the year.
4. Hindoostanee.
5. Best Note Book, with original sketches, or drawings from measurements of works in progress at Roorkee.
6. Private studies. (In a separate paper is given a list of books and portions of books recommended to be read.)
7. Drawing.

The number of prizes is not limited to one for each of the above branches or subjects; more than one will be given when proficiency

is shown by others besides the most successful candidates. On the other hand, no prize will be given when no marked proficiency is shown by any of the competitors.

To the non-stipendiary students of the department, similar prizes are offered, on the same conditions.

Civil Engineering College.

The following prizes in the Drawing Department are open to the competition of all students of the College.

1. Topographical Drawing.

2. Architectural Drawing.

(It will be understood that no plan will be considered a creditable one which is defaced by bad printing.)

3. Perspective and Isometrical Projection; knowledge of the principles and application to practice.

4. Pencil Drawing. The specimens offered for competition to include at least (six) sketches from nature.

The number of prizes is not limited to one under each of the above heads. More than one will be given when special reward is merited by others besides the most successful candidates. On the other hand, no prize will be awarded when no marked proficiency has been attained by any of the competitors.

Civil Engineering College.

Prize List, 1st Department.

Hurree Churn, -- -- -- -- --	2nd Mathematics. Drawing. Essay. Note Book.
Kunhya Lal, -- -- -- -- --	1st Mathematics. Engineering. Surveying. Private studies.

2nd Department.

Gunner E. McMillan,-- -- -- --	Mathematics. Surveying. Note Book.

Gunner S. McKenney, -- -- --	Mathematics.
Corporal W. Beazley, -- -- --	Drawing.
Bugler H. Reynolds, -- -- -- --	Drawing.

3rd Department, Senior Division.

Kedar Nath, -- -- -- -- -- --	Mathematics.

3rd Department, Junior Division.

Abdoor Ruhman, -- -- -- --	Drawing.

General.

Kedar Nath, -- -- -- -- -- --	Topographical Drawing.
J. Todd, -- -- -- -- -- --	Architectural Drawing.
J. Todd, -- -- -- -- -- --	Pencil Drawing.

(B.) EXAMINATION PAPERS.

Questions in Mathematics, proposed to the Senior Class, Agra College, and Answers by Azeem Buksh.

Q.—Find $\frac{du}{dx}$ when $u = \frac{a^2 + x^2}{\sqrt{ax + x^2}}$

$$u = (1 - \sqrt{x} + \sqrt[3]{x})^{\frac{4}{3}}$$

$$u = \frac{ax}{a^{2x} - 1}$$

$$u = \log \frac{\sqrt{x^2 + a^2} - x}{\sqrt{x^2 + a^2} + x}$$

$$u = \cos x . \sin 2x$$

$$u = \tan^{-1}\left(\frac{2x}{1 - x^2}\right)$$

A.—(α.) Given $u = \frac{a^2 + x^2}{\sqrt{ax + x^2}}$, it is required to find $\frac{du}{dx}$

By squaring $u^2 = \frac{a^4 + 2a^2x^2 + x^4}{ax + x^2}$

$$\therefore 2u \frac{du}{dx} = \frac{(ax + x^2)\, d\,(a^4 + 2a^2 x^2 + x^4) - (a^4 + 2a^2x^2 + x^4) \times d.\,(ax + x^2)}{(ax + x^2)^2}$$

$$= \frac{(ax + x^2)\,(4a^2x + 4x^3) - (a^4 + 2a^2x^2 + x^4)\,(a + 2x)}{(ax + x^2)^2}$$

$$= \frac{(4a^3x^2 + 4ax^4 + 4a^2x^3 + 4x^5) - (a^5 + 2a^3x^2 + ax^4 + 2a^4x + 4a^2x^3 + 2x^5)}{(ax + x^2)^2}$$

$$= \frac{2x^5 + 3ax^4 + 2a^3x^2 - 2a^4x - a^5}{(ax + x^2)^2}$$

$$\therefore \frac{du}{dx} = \frac{2x^5 + 3ax^4 + 2a^3x^2 - 2a^4x - a^5}{2u\,(ax + x^2)^2}$$

$$= \frac{2x^5 + 3ax^4 + 2a^3x^2 - 2a^4x - a^5}{2\,(ax + x^2)} \times \frac{\sqrt{ax + x^2}}{a^2 + x^2}$$

$$= \frac{2x^5 + 3ax^4 + 2a^3x^2 - 2a^4x - a^5}{2(a^2 + x^2)\,(ax + x^2)^{\frac{3}{2}}}$$

(β).—Given $u = (1 - \sqrt{x} + \sqrt[3]{x})^{\frac{4}{3}}$ required to find $\frac{du}{dx}$

$$\text{or } u^{\frac{5}{4}} = 1 - x^{\frac{1}{2}} + x^{\frac{1}{3}}$$

$$\frac{5}{4} u^{\frac{1}{4}} \frac{du}{dx} = -\frac{1}{2} x^{-\frac{1}{2}} + \frac{1}{3} x^{-\frac{2}{3}}$$

$$= \frac{1}{3x^{\frac{2}{3}}} - \frac{1}{2x^{\frac{1}{2}}} = \frac{2x^{\frac{1}{2}} - 3x^{\frac{2}{3}}}{6x^{\frac{7}{6}}}$$

$$\therefore \frac{du}{dx} = \frac{4(2x^{\frac{1}{2}} - 3x^{\frac{2}{3}})}{u^{\frac{1}{4}} \times 30x^{\frac{7}{6}}} = \frac{4(x^{\frac{1}{2}} - 3x^{\frac{2}{3}})}{30x^{\frac{7}{6}}(1 - x^{\frac{1}{2}} + x^{\frac{1}{3}})^{\frac{1}{5}}}$$

$$= \frac{2(x^{\frac{1}{2}} - 3x^{\frac{2}{3}})}{15x^{\frac{3}{6}+\frac{4}{6}}(1 - x^{\frac{1}{2}} + x^{\frac{1}{3}})^{\frac{1}{5}}}$$

$$= \frac{2(1 - 3x^{\frac{1}{6}})}{15x^{\frac{2}{3}}(1 - x^{\frac{1}{2}} + x^{\frac{1}{3}})^{\frac{1}{5}}}$$

$$= \frac{2(1 - 3\sqrt[6]{x})}{15\sqrt[3]{x^2}\sqrt{1 - \sqrt{x} + \sqrt[3]{x}}}$$

(γ).—Given $u = \frac{ax}{a^{2x} - 1}$. It is required to find $\frac{du}{dx}$

$$\frac{du}{dx} = \frac{(a^{2x} - 1)\frac{d \cdot ax}{dx} - ax \cdot \frac{d(a^{2x} - 1)}{dx}}{(a^{2x} - 1)^2}$$

$$= \frac{a(a^{2x} - 1) - ax \times 2a^{2x}}{(a^{2x} - 1)^2}$$

$$= \frac{a(a^{2x} - 1) - 2x\,a^{2x})}{(a^{2x} - 1)^2} = \frac{a(1 - 2x)\,a^{2x} - 1)}{(a^{2x} - 1)^2}$$

$$= \frac{(1 - 2x)\,a^{2x+1} - a}{(a^{2x} - 1)}$$

(δ).—Given $u = \log \frac{\sqrt{x^2 + a^2} - x}{\sqrt{x^2 + a^2} + x}$. Find $\frac{du}{dx}$

$$\text{or } u = \log(\sqrt{x^2 + a^2} - x) - \log(\sqrt{x^2 + a^2} + x)$$

$$\frac{du}{dx} = \frac{\frac{d}{dx}\left(\sqrt{x^2+a^2}-x\right)}{\sqrt{x^2+a^2}-x} - \frac{\frac{d}{dx}\left(\sqrt{x^2+a^2}+x\right)}{\sqrt{x^2+a^2}+x}$$

but $\frac{d}{dx}\left(\sqrt{x^2+a^2}\mp x\right)$

$$= \frac{1}{2}(x^2+a^2)^{-\frac{1}{2}}\,2x \mp 1$$

$$= \frac{x}{\sqrt{x^2+a^2}} \mp 1$$

$$= \frac{x \mp \sqrt{x^2+a^2}}{\sqrt{x^2+a^2}}$$

$$\therefore \frac{du}{dx} = \frac{x-\sqrt{x^2+a^2}}{\left(\sqrt{x^2+a^2}-x\right)\sqrt{x^2+a^2}} - \frac{x+\sqrt{x^2+a^2}}{\left(\sqrt{x^2+a^2}+x\right)\sqrt{x^2+a^2}}$$

$$= \frac{x-\sqrt{x^2+a^2}}{(x^2+a^2)-x\sqrt{x^2+a^2}} - \frac{x+\sqrt{x^2+a^2}}{(x^2+a^2)+x\sqrt{x^2+a^2}}$$

$$= \frac{\begin{array}{r} x(x^2+a^2) + x^2\sqrt{x^2+a^2} - (x^2+a^2)\sqrt{x^2+a^2} \\ - x(x^2+a^2) - (x^2+a^2)\sqrt{x^2+a^2} \\ + x^2\sqrt{x^2+a^2} + x(x^2+a^2) \end{array}}{(x^2+a^2)^2 - x^2(x^2+a^2)}$$

$$= \frac{2x^2\sqrt{x^2+a^2} - 2(x^2+a^2)\sqrt{x^2+a^2}}{(x^2+a^2-x^2)(x^2+a^2)}$$

$$= 2\frac{(x^2-x^2-a^2)\sqrt{x^2+a^2}}{a^2(x^2+a^2)} = 2\frac{-a^2}{a^2\sqrt{x^2+a^2}} = -\frac{2}{\sqrt{x^2+a^2}}$$

(*e*).—Given $u = \cos x \sin 2x$, to find $\frac{du}{dx}$

$$\frac{du}{dx} = \cos x\frac{du}{dx}\sin 2x + \sin 2x\frac{d}{dx}\cos x$$

$$= \cos x \,.\, 2\cos 2x + \sin 2x\,(1-\sin x)$$

$$= 2\cos x\cos 2x - \sin 2x \,.\, \sin x$$

$$= \cos 2x\cos x - \sin 2x \,.\, \sin x + \cos 2x\cos x$$

$$= \cos(2x+x) + \cos 2x \,.\, \cos x$$

$$= \cos 3x + \cos 2x \,.\, \cos x$$

(φ).—Given $u = \tan^{-1} \frac{2x}{1 - x^2}$, to find $\frac{du}{dx}$

$$\tan u = \frac{2x}{1 - x^2}$$

$$\frac{d2x}{1 - x^2} = d \tan u$$

$$\frac{(1 - x^2)\, d\, 2x - 2x\, d\,(1 - x^2)}{(1 - x^2)^2} = (1 + \tan^2 u)\, du$$

$$\frac{2(1 - x^2) - 2x\,(1 - 2x)}{(1 - x^2)^2} = \frac{du}{dx} \frac{(1 - x^2)^2 + 4x^2}{(1 - x^2)^2}$$

$$= \frac{1 - 2x^2 + x^4 + 4x^2}{(1 - x^2)^2} \frac{du}{dx}$$

$$2 + 2x^2 = (1 + 2x^2 + x^4) \frac{du}{dx}$$

$$\therefore \frac{du}{dx} = \frac{2(1 + x^2)}{1 + 2x^2 + x^4}$$

$$= \frac{2(1 + x^2)}{(1 + x^2)^2} = \frac{2}{1 + x^2}$$

Q. 3.—Prove Taylor's theorem and thence deduce Maclaurin's, and explain the causes of what is called the failure of the former.

A.— $$u_1 = (x + h) = u + \frac{du}{dx} . h + \frac{d^2u}{dx^2} \frac{h^2}{1 \cdot 2} + \frac{d^3u}{dx^3} \cdot \frac{h^3}{2 \cdot 3} + \cdots + \frac{d^nu}{du^n} \cdot \frac{h^n}{2 \cdots n}$$

is called Taylor's theorem. Is is required to prove it. Before we enter upon proving this theorem, it is necessary to show that $\frac{du_1}{dx} = \frac{du_1}{dh}$ and $\frac{d^2u}{dx^2} = \frac{d^2u}{dh^2}$, &c. and ---- and $\frac{d^nu}{dx^n} = \frac{d^nu}{dh^n}$

when $u^1 = f(x \pm h)$

and $u_1 = f(x \pm 2h)$

In this variation it is immaterial whether x becomes $x \pm h$, or $\pm h$ becomes $\pm h \pm h$, and it is evident that the differential co-efficient of u_1 depends on the variation of either of them, thus

$u_1 - u^1 = f(x' \pm 2h) - f(x \pm h)$ when x becomes $x \pm h$

$u_1 - u^1 = f(x \pm 2h) - f(x \pm h)$ when h becomes $x + h$

Therefore $\frac{du_1}{dx} = \frac{du_1}{dh}$

and similarly $\frac{d^2u_1}{dx^2} = \frac{d^2u_1}{dh^2}$: $\frac{d^nu_1}{dx^n} = \frac{d^nu_1}{dh^n}$

As far as we know.

$$(\alpha).—u_1 = u + \frac{du}{dx}h + P\frac{d^2u}{dx^2}h^{\alpha} + Q\frac{d^3u}{dx^3}h^{\beta} + \&c. \&c.$$

Differentiating with respect to h, we have

$$\frac{du_1}{dh} = \frac{du}{dh} + \alpha P\frac{d^2u}{dh^2}h^{\alpha-1} + \beta Q\frac{d^3u}{dh^3}h^{\beta-1} + \&c.$$

and differentiating with respect to x we have

$$\frac{du_1}{dx} = \frac{du}{dx} + \frac{d^2u}{dx^2}h + P\frac{d^3u}{dx^3}h^{\alpha} + Q\frac{d^4u}{dx^4}h^{\beta} + \&c.$$

but $\frac{du_1}{dx} = \frac{du_1}{dh}$

$$\therefore \frac{du}{dx} + \alpha P\frac{d^2u}{dh^2}h^{\alpha-1} + \beta Q\frac{d^3u}{dh^3}h^{\beta-1} + \&c. \&c.$$

$$= \frac{du}{dx} + \frac{d^2u}{dx^2}h + P\frac{d^3u}{dx^3}h^{\alpha} + \&c. \&c.$$

By comparing co-efficients we have

$$\begin{aligned} h^{\alpha-1} &= h \text{ or } \alpha = 2 \\ \alpha P &= 1 \text{ or } P = \tfrac{1}{2} \\ \beta-1 &= \alpha \text{ or } \beta = 3 \\ \beta Q &= P \text{ or } Q = \frac{1}{2.3} \ \&c. \&c. \end{aligned}$$

and substituting these values of P, Q, &c. and α, β, &c. we have

$$u_1 = u + \frac{du}{dx}h + \frac{d^2u}{dx^2}\frac{h^2}{2} + \frac{d^3u}{dx^3}\frac{h^3}{2.3} + \&c.$$

By this theorem, which is proved independently of Maclaurin's theorem, we can deduce the latter.

$$u_1 = u + \frac{du}{dx}h + \frac{d^2u}{dx^2}\frac{h^2}{2} + \frac{d^3u}{dx^3}\frac{{}^3h}{2.3} + \frac{d^4u}{dx^4}\frac{h^4}{2.3.4} + \&c.$$

Let h = o, the value of $u = u_0$

carrying on the process

$$\frac{du_1}{dx} = \frac{du}{dx} + \frac{d^2u}{dx^2}h + \frac{d^3u}{dx^3}\frac{h^2}{2} + \frac{d^4u}{dx^4}\frac{h^3}{2.3} + \&c.$$

and $\frac{d^2u_1}{dx^2} = \frac{d^2u}{dx^2} + \frac{d^3u}{dx^3} h + \frac{d^4u}{dx^4} \frac{h^2}{2} + \frac{d^5u}{dx^5} \frac{h^3}{2.3} + \&c.$

and $\frac{d^3u_1}{dx^3} = \frac{d^3u}{dx^3} + \frac{d^4u}{dx^4} h + \frac{d^5u}{dx^5} \frac{h^2}{2} + \frac{d^6u}{dx^6} \frac{h^3}{2.3} + \&c.$

Making $h = o$, we shall have

$$\frac{du_1}{dx} \text{ or } u_1 = \frac{du}{dx},$$

$$\frac{d^2u_1}{dx^2} \text{ or } u_2 = \frac{d^2u}{dx^2}$$

$$\frac{d^3u_1}{dx^3} \text{ or } u_3 = \frac{d^3u}{dx^3} \text{ and so on.}$$

and by substituting these values in the original equation, we have

$$u_1 = u_0 + u_1 h + u_2 \frac{h^2}{2} + u_3 \frac{h^3}{2 \cdot 3} + u_4 \frac{h^4}{2.3.4} + \&c.$$

and putting x for h (as we generally use x and not h for a variable) we have

$$u_1 = u_0 + u_1 x + u_2 \frac{x^2}{2} + u_3 \frac{x^3}{2.3} + u_4 \frac{x^4}{2.3.4} + \&c.$$

and this is the form of Maclaurin's theorem.

Q.—Find the value of $u = \text{Sec} \frac{\pi x}{2} \log \frac{1}{x}$ when $x = 1$

A.—Given $u = \text{Sec} \frac{\pi x}{2} \log \frac{1}{x}$. It is required to find the value of u_1 when $x = 1$

$$u = \text{Sec} \frac{\pi x}{2} \log \frac{1}{x} = \frac{\log \left(\frac{1}{x}\right)}{\cos \pi x}$$

$$\text{when } x = 1, u = \frac{o}{o}$$

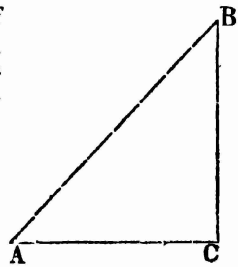
$$u = \frac{\frac{d. \log \frac{1}{x}}{dx}}{\frac{d. \cos x}{dx}}$$

$$u = \frac{-\frac{1}{x}}{-\sin\frac{\pi x}{2}} = \frac{\frac{1}{x}}{\text{sine}\ \frac{\pi x}{2}}$$

$$u = \frac{1}{1} = 1 \text{ when } x = 1.$$

Q.—Given the area of a right-angled triangle to find the sum of the sides a minimum.

A.—Let ABC be a right ∠d triangle of which C is the right ∠. Let area of △ ABC = a. It is required to find the sum of the 3 sides AB, BC, AC, when minimum.



Let $x = AC$

and $y = BC$

Then $AB = \sqrt{x^2 + y^2}$

$$\frac{1}{2}xy = a \text{ or } y = \frac{2a}{x}$$

$$u = x + y + \sqrt{x^2 + y^2}$$

$$= x + \frac{2a}{x} \quad \sqrt{x^2 + \frac{4a^2}{x^2}}$$

$$\frac{du}{dx} = 1 - \frac{2a}{x^2} + \frac{d}{dx}\frac{\sqrt{x^4 + 4a^2}}{x}$$

$$= 1 - \frac{2a}{x^2} + \frac{x^4 - 4a^2}{x^3\sqrt{x^4 + 4a^2}} = 0$$

$$\text{or } x^3\sqrt{x^4 + 4a^2} - 2a\,x\sqrt{x^4 + 4a^2} + x^4 - 4a^2 = 0$$

This being an equation involving one unknown quantity, x can be found. But the other method is more simple, thus:

$$u = y + x + \sqrt{y^2 + x^2} \text{ as before}$$

$$= y + \frac{2a}{y} + \sqrt{y^2 + \frac{2a}{y^2}}$$

$$\frac{du}{dy} = 1 - \frac{2a}{y^2} + \frac{y^4 - 4a^2}{y^3\sqrt{x^4 + 4a^2}} = 0$$

$$y^3\sqrt{y^4 + 4a^2} - 2ay\sqrt{y^4 + 4a^2} + y^4 - 4a^2 = 0$$

$$\text{Therefore } o = y^3\sqrt{y^4+4a^2} - 2ay\sqrt{y^4+4a^2} + y^4 - 4a^2 =$$
$$= x^3\sqrt{x^4+4a^2} - 2ax\sqrt{x^4+4a^2} + x^4 - 4a^2$$

or,

$$y^3\sqrt{y^4+4a^2} - 2ay\sqrt{y^4+4a^2} + y^4 - 4a^2 = x^3\sqrt{x^4+4a^2}$$
$$- 2ax\sqrt{x^4+4a^2} + x^4 - 4a^2$$

Since these two equations involving x and y are derived on the same principle and involve the same constant quantity, and are each equal to the same quantity, it follows that $x = y$.

Hence $xy = 2a$ or $x^2 = 2a$

$$\text{Now } u = x + x + \sqrt{x^2+x^2}$$
$$= 2x + \sqrt{2x^2} = 2\sqrt{2}a + \sqrt{2.2a}$$
$$= (2+\sqrt{2})\sqrt{2a}.$$

Hence $x = \sqrt{2}a$ and $y = \sqrt{2}a$, and therefore the triangle is a right-angled isosceles triangle.

Q.—Integrate (a) $\dfrac{dx}{\epsilon^x + 1}$

(b) $\dfrac{dx}{\cos^3 x}$

A.—Given $\dfrac{du}{dx} = \dfrac{1}{\epsilon^x + 1}$ to find u.

$$\text{Let } z = \epsilon^x \therefore dz = \epsilon^x\,dx \text{ or } dx = \frac{dz}{\epsilon^x} = \frac{dz}{z}$$

by substitution

$$du = \frac{dx}{\epsilon^x + 1} = \frac{1}{z+1}\cdot\frac{dz}{z}$$
$$\frac{du}{dz} = \frac{1}{z(z+1)}$$
$$\int du = u = \int \frac{dz}{z(z+1)}$$
$$\frac{U}{V} = \frac{A}{z} + \frac{B}{z+1}$$
$$i.\ e.\ \frac{1}{z(z+1)} = \frac{A}{z} + \frac{B}{z+1}$$
$$\therefore 1 = Az + A + Bz = (A+B)z + A.$$

By equating co-efficients of corresponding terms we have $A = 1$

$$A + B = 0 \therefore B = -1$$

by substitution

$$u = \int \frac{dz}{z(z+1} = \int \frac{Adz}{z} + \int \frac{Bdz}{z+1}$$

$$= \int \frac{dz}{z} - \int \frac{dz}{z+1}$$

$$= \int \frac{dz}{z} - \int \frac{d(z+1)}{z+1}$$

$$= \log z - \log z + 1$$

$$= \log\left(\frac{z}{z+1}\right)$$

$$= \log \frac{\varepsilon^x}{\varepsilon^x + 1} \therefore \int \frac{dx}{\varepsilon^x + 1} \log \frac{\varepsilon^x}{\varepsilon^x + 1}$$

(6).—Given $\frac{1}{\cos^3 x}$ to find $\frac{du}{dx}$

$$\int \frac{dx}{\cos^3 x} = \int \left\{\frac{2\ dx}{\cos x} + \frac{dx}{\cos^3 x} - \frac{2\ dx}{\cos x}\right\}$$

$$= \int \left\{\frac{2\ dx}{\cos x} + \frac{dx}{\cos^3 x} - \frac{2\ dx}{\cos x}\right\}$$

$$= \int \frac{2dx}{\cos x} + \frac{du}{\cos^3 x} - \int \frac{2dx}{\cos x}$$

$$= \frac{1}{\cos x} - 2\int \frac{du}{\cos x}.$$

$\int \frac{du}{\cos x}$ can be integrated. Take $\cos x = z$

$\therefore$ sine x. $dx = dz$

$$\therefore \int \frac{dx}{\cos x} = -\frac{dz}{z \text{ sine } x} = \frac{-dz}{z\sqrt{\text{sine}^2 x}} = \frac{-dz}{z\sqrt{1 - \cos^2 x}} = \frac{-dz}{z\sqrt{1 - x^2}}$$

which is of the form of the first example of the 14th question, and can be integrated. If the 14th question were given, I should have integrated that number first, and then by substitution of homogeneous quantities,--------

Q.—Integrate $\frac{dx}{1 + x^2}$ and thence find the value of $\tan^{-1} x$ in terms of x.

A.—By differential calculus we know that

$$d \tan^{-1} x = \frac{1}{1 + x^2} \text{ thus}$$

$$\text{let } u = \tan^{-1} x, \text{ then } \tan u = x$$

$$\text{by differentiating } (1 + \tan^2 u)\, du = dx$$

$$du = \frac{dx}{1 + \tan^2 u}$$

$$du = \frac{dx}{1 + x^2}$$

$$\therefore d \tan^{-1} x = du = \frac{dx}{1 + x^2}$$

$$\text{therefore } \int \frac{dx}{1 + x^2} = \tan^{-1} x$$

Q.—Prove that the area of a curve of the parabola species whose equation is $px = y^n$ is $\frac{ny^{n+1}}{(n+1)p} + C$ and thence find the area of the common parabola.

A.—By differential calculus we have

$$\frac{dA}{dx} = y \text{ where } y = f\ (x)$$

$$\text{In this case } y = p^{\frac{1}{n}}\ x^{\frac{1}{n}} \text{ or } y^n = px$$

$$\frac{dA}{dx} = y = p^{\frac{1}{n}} x^{\frac{1}{n}}$$

$$dA = p^{\frac{1}{n}}\ x^{\frac{1}{n}} \,.\, dx$$

$$A = \int p^{\frac{1}{n}} x^{\frac{1}{n}}\, dx$$

$$= p^{\frac{1}{n}} \int x^{\frac{1}{n}}\, dx$$

$$= p^{\frac{1}{n}} \frac{x^{\frac{1}{n}+1}}{\frac{1}{n} + 1} + C$$

$$= \frac{p^{\frac{1}{n}} x^{\frac{1+n}{n}}}{\frac{1+n}{n}} + C$$

$$= \frac{{}^{n}(p^{n+1} x^{n+1})^{\frac{1}{n}}}{(n+1)^{p}} + C$$

$$= \frac{ny^{n+1}}{(n+1)P} + C$$

In the common parabola, whose equation is $y^2 = 4\,mx$, $n = 2$ and $p = 4m$, by substituting these values in the general equation

$$A = \frac{2y^{2+1}}{2+1} + C = \frac{2y + y^2}{3.4m} + C$$

$$= \frac{2xy}{3} + C$$

If $x = o$, $A = o$, $\therefore C = o$

Hence $A = \frac{2}{3}\,xy$

and the whole parabolic area $= \frac{2}{3} . 2xy = \frac{2}{3}$ of the circumscribed rectangle.

Q.—Find the content of the solid generated by the revolution of the segment of a parabola about its axis.

A.—By differential calculus we know that

$$\frac{dS}{dx} = \pi y^2 \text{ ; where } y = f(x)$$

here $y^2 = 4\,mx$

$$dS = 4\,\pi mx\,.\,dx$$

$$\int dS = 4\,\pi m \int x\,dx$$

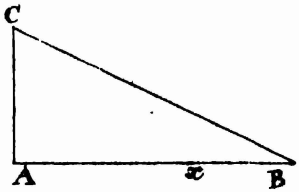
$$S = \frac{4\,\pi m}{2}\,x^2 = \frac{\pi}{2}x\,.\,4\,mx = \frac{\pi}{2}\,xy^2 + C$$

If $x = o$, $S = o$, $\therefore C = o$

Hence $S = \frac{\pi}{2}\,xy^2$

Q.—A hare runs along a straight hedge. A greyhound with velocity double that of the hare starts in pursuit from a point whose perpendicular distance from the wall is (a) at the moment the hare passes that perpendicular. Determine the curve described by the greyhound?

A.—Let A be the starting point of the hare, and C that of the greyhound, and AB the distance.



By differential Calculus $\frac{ds}{dx} = \frac{1}{a}\sqrt{1 + \left(\frac{dy}{dx}\right)^2}$

and A denote the inverse ratio

$$\therefore 2a = \sqrt{1 + \left(\frac{dy}{dx}\right)^2}$$

$$4a^2 = 1 + \left(\frac{dy}{dx}\right)^2$$

$$\sqrt{4a^2 - 1} = \frac{dy}{dx}$$

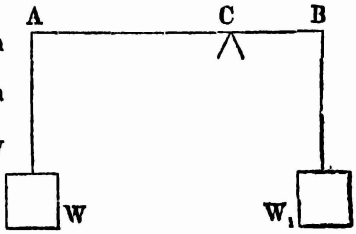
$$dy = \sqrt{4a^2 - 1}\,.\,dx$$

$$y = \sqrt{4a^2 - 1}\,.\,x$$

This is the equation of the curve which the greyhound will describe.

Q.—A straight lever being in equilibrium with two forces acting perpendicularly on the same side of the fulcrum, find the pressure on the fulcrum?

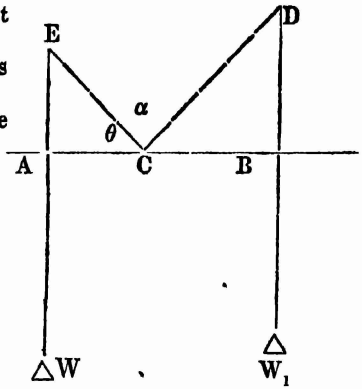
A.—Let P be the pressure on the fulcrum C, whose distance from the points of application is inversely as the weights W and W_1



Then $P = W + W_1$

Q.—Given the angle between the arms of a uniformly bent lever, the length of the arms and the weights suspended at their extremities to find the position of equilibrium.

A.—Let ECD be the bent lever, W and W_1 the two weights on the two ends E and D, C the fulcrum, ACB a horizontal line.



Let EC = a

CD = b

ECD = α

ECA = θ

For equilibrium $\dfrac{W}{W_1} = \dfrac{BC}{AC} = \dfrac{b.\sin(180^\circ - (\alpha + \theta)}{a \sin \theta}$

$$= \frac{b}{a} \frac{\sin(\alpha + \theta)}{\sin \theta}$$

$$= \frac{b}{a} \frac{\sin \alpha \cos \theta + \cos \alpha \sin \theta}{\sin \theta}$$

$$= \frac{b}{a} (\sin \alpha \tan \theta + \cos \alpha)$$

$$\therefore \frac{aW}{bW_1} = \sin \alpha \tan \theta + \cos \alpha$$

$$\therefore \sin \alpha \tan \theta = \frac{aW}{bW_1} - \cos \alpha$$

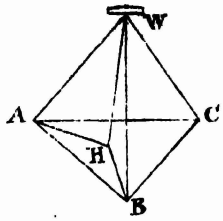
$$\therefore \tan \theta = \frac{aW}{bW_1 \sin \alpha} - \frac{\cos \alpha}{\sin \alpha}$$

$$= \frac{aW - bW_1 \cos \alpha}{\sin \alpha}$$

θ being found, the position of equilibrium is found also.

Q.—A theodolite of weight W being supported on a tripod stand of given dimensions, in any given position, find the pressure on each of the three legs.

A.—Let W be the weight of the theodolite; WA, WB, and WC the three legs of it, represented respectively by a, b, and c; and WH perpendicular to the ground.



and let WH = h = height at given position.

The pressure on WA or $P_1 = \frac{h}{a}$, $P_2 = \frac{h}{b}$, $P_3 = \frac{h}{c}$

$$\text{But } W = P_1 + P_2 + P_3$$

$$= \frac{h}{a} + \frac{h}{b} + \frac{h}{c} = h\left(\frac{1}{a} + \frac{1}{b} + \frac{1}{c}\right)$$

$$\frac{W}{h} = \frac{bc + ab + ac}{abc}$$

$$\therefore \frac{bc + ac + ab}{abc}\ h : W :: \frac{h}{a} : P_1 :: \frac{h}{b} : P_2 :: \frac{h}{c} : P_3$$

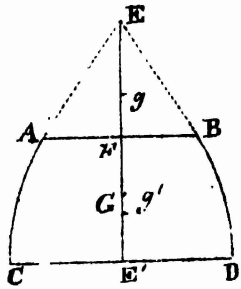
$$\therefore P_1 = \frac{Wh \times abc}{a(bc + ac + ab).\ h} = \frac{W\ .\ bc}{bc + ac + ab}$$

$$\text{Similarly } P_2 = \frac{W.\ ac}{bc + ac + ab}$$

$$\text{and } P_3 = \frac{W.\ ab}{bc + ac + ab}$$

Q.—Show how to find the centre of gravity of a trapezioid?

A.—Let ABDC be the trapezioid. Produce CA and DB till they meet in E. Let g_1 be the centre of gravity of ECD, and suppose G the centre of gravity of the trapezioid BC



Let CD = a
AB = b
FE = c

Let A be the area of the △ AEB

Then ABE : ECD :: $b^2 : a^2$

$$ECD = \frac{a^2 A}{b^2} \text{ and trapezioid } ACDB = \left(\frac{a^2}{b^2} - 1\right) A$$

$$EF : EE_1 :: b : a$$

$$EE_1 - EF : EF :: a - b : b$$

$$EF : FE^1 :: a - b : b$$

$$EF = \frac{a - b}{b} FE_1 = \frac{(a - b)}{b} c$$

by taking the moments

$$ABE . Eg + ABDC . FG_1 = ECD . EE_1$$

$$\frac{2}{3} A . \frac{a - b}{b} FE_1 + \left(\frac{a^2}{b^2} - 1\right) A x = \frac{2}{3} A \frac{a^2}{b^2} . a + \frac{a - b}{b} c$$

$$\frac{a - b}{b} c + \left(\frac{a^2}{b^2} - 1\right) \frac{3}{2} x = \frac{a^2}{b^2} \left(a + \frac{a - b}{b} c\right)$$

$$\frac{3}{2} \left(\frac{a^2 - b^2}{b^2}\right) x = \frac{a^3}{b^2} + \frac{ac - bc}{b^3} - \frac{ac - bc}{b}$$

$$\frac{3}{2} (a^2 - b^2) x = a^3 + \frac{ac - bc}{b} - abc + b^2c$$

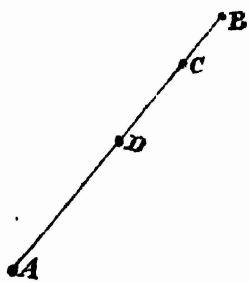
$$= \frac{ba^3 + ac - bc - ab^2c + b^3c}{b}$$

$$\therefore x = \frac{2ba^3 + ac - bc - ab^2c + b^3c}{3b (a^2 - b^2)}$$

which may be reduced.

Q.—Divide the length of a given inclined plane into three such parts, that the times of descent down all three may be equal.

A.—For the descent velocity increases as 1, 3, 5, 7, &c. Therefore the inclined plane AB for three such parts may be divided thus:



$$BC : CD : DA :: 1 : 2 : 3$$

$$BC : BA :: 1 : 6$$

$$BC = \tfrac{1}{6} AB = \tfrac{1}{6} a$$

$$CD = \tfrac{1}{4} AB = \tfrac{1}{4} a$$

$$AD = \tfrac{1}{2} AB = \tfrac{1}{2} a$$

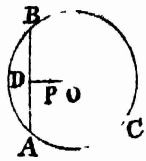
Q.—A second's pendulum loses quarter of a minute in 24 hours. How is it to be corrected?

A.—$24 \times 60 \times 60 = 1440 \times 60 = 86400 \times 4 = 345600$

The length of the pendulum must be lengthened so much that in each vibration it may gain $\frac{1}{345600}$ of a second.

Q.—Find the plane of shortest descent from a given point within a circle to the circumference?

A.—Let ABC be a circle whose centre is O and P any point in it. Join PO_1 and produce OP to D and make PD = OP and draw BA at rt. ∠s to DP. Now taking O as the focus of a parabola and AB its directrix, describe a parabola, and the plane of this parabola is the shortest plane of descent.



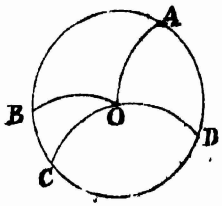
$$S = \tfrac{1}{2} gt^2 \therefore t^2 = \frac{2S}{g} = 4cS \text{ making } \frac{2}{g} = 2c$$

$$\therefore y^2 = 4\,mx$$

which is the general equation to the parabola.

Q.—Show that if a number of bodies are projected with equal velocities in different directions from the same point at the same instant, they will all, at the end of a given time, be found in the surface of a sphere?

A.—Let O be the point, and OA, OB, OC, OD the four different directions of projection, and since they are all projected with equal velocities at the same instant, therefore their respective distances at any other time, which, independent of the directions, are equal to one another, and if they are all in one plane, like the plane of this paper, they are on the circumference of the circle whose radius is the distance of any one of them from O, and similarly for those which are without the plane of the paper. Wherefore all bodies projected with equal velocities, at the same instant, though in different directions, are, at all times, in the circumference of the sphere whose centre is the starting point at a distant equal to the distance of any one of the projected bodies.

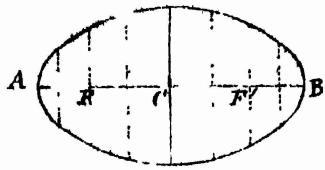


Q.—Trace the Ellipse from its equation?

A.—The equation to an Ellipse is

$$\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1 \text{ or } y = \pm \frac{b}{a}\sqrt{a^2 - x^2}$$

The origin of any of these equations is the centre of the Ellipse, and the following is when the origin is at one of the extremities of the transverse axis when it is coincident with it.



(1) Let $\pi = o$ then we have $y = \pm \frac{b}{a}\sqrt{a^2} = \pm b$

(2) $x = \pm \frac{1}{4}a \quad \therefore x = \frac{1}{16}{}^2a$

$$\therefore y = \pm \frac{b}{a}\sqrt{\frac{15}{16}a^2} = \pm \frac{b}{4}\sqrt{15}$$

(3) $x = \pm \frac{1}{2}a$ or $x^2 = \frac{1}{4}a^2$

$$y = \pm \frac{b}{a}\sqrt{\tfrac{3}{4}a^2} = b\sqrt{\tfrac{3}{4}}$$

(4) $x = \pm \frac{3}{4}$ or $x^2 = \frac{9}{16}a^2$

$$\therefore y = b\sqrt{\frac{7}{16}}$$

(5) $x = \pm a$ or $x^2 = a^2$

$$\therefore y = \pm \frac{b}{a}\sqrt{a^2 - x^2} = o$$

By joining these several points the curve ellipse is traced, and similarly the ellipse may be traced by the other equation given above, and also by its Polar equation.

Q.—Find the equation to the tangent to a parabola, and thence deduce the value of the sub-tangent?

A.—$y^2 = 4ax$ is the equation to a parabola.

$y = mx + n$ is the equation of a straight line.

The origin of both of these equations being taken as the focus of the parabola, the values of x and y are in both cases equal, when they meet: therefore there remains only to determine the ratios between the constants a, m, and n.

$$(1)\ y^2 = 4ax$$

From $(2)\ y^2 = m^2 x^2 + 2\,mnx + n^2$

eliminating we have $m^2 x^2 + 2\,mnx + n^2 - 4\,ax = 0$

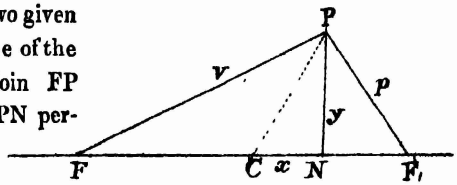
$$\text{or } x^2 + \frac{2\,mn - 4a}{m^2}\,x = -\frac{n^2}{m^2}$$

This equation is quadratic, and gives two values, but the straight line is tangent in one point only. Therefore one of the values of x is o, and the other condition is found here that in form will be this equation, so that we can find x = o.

Time being little I cannot finish it.

Q.—Find the equation to the curve, the line of the distances of every point of which from two given points is 2a.

A.—Let F and F_1 be the two given points, and 2a the sum of the distances of every point from the two given points. Let P be one of the points of the focus. Join FP and F_1P, and draw PN perpendicular on FF^1.



Join CP.

Let $CN = x$ and $FP = v$
$PN = y$ $F_1P = p$
$F_1C = e$

$$y^2 = PF^2 - FN^2 = v^2\,(e + x)^2 \text{----------} (1)$$

$$y^2 = PF_1{}^2 - F_1N^2 = (2a - v)^2 - (e - x)^2 \text{--} (2)$$

by (1) and (2) $v^2\,(e + x)^2 = (2a - v)^2 - (e - x)^2$

$$\therefore v^2 - e^2 - x^2 - 2ex = 4a^2 + v^2 - 4av - e^2 - x^2 + 2ex$$

$$\text{or } -2ex = 4a^2 - 4ax + 2ex$$

by transposition $4av = 4a^2 + 4ex$

$$av = a^2 + ex$$

$$\therefore v = \frac{a^2 + ex}{a} \text{ or } v = a + \frac{ex}{a}$$

by substituting this value in equation (1) we have

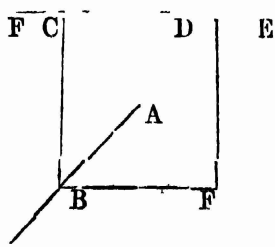
$$y^2 = a^2 + \frac{ex^2}{a^2} + 2ex - e^2 - x^2 - 2ex = a^2 - e^2 + \left(\frac{e^2}{a^2} - 1\right)x^2$$

$$y^2 = b^2 + \frac{e^2 - a^2}{a^2} x^2; \text{ take } b^2 = a^2 - e^2$$

$$y^2 = b^2 - \frac{b^2}{a^2} x^2 = \frac{b^2}{a^2} (a^2 - x^2)$$

$y = \pm \frac{b}{a} \sqrt{a^2 - x^2}$: which is the equation to an ellipse. Therefore the curve is an ellipse whose major axis is 2a.

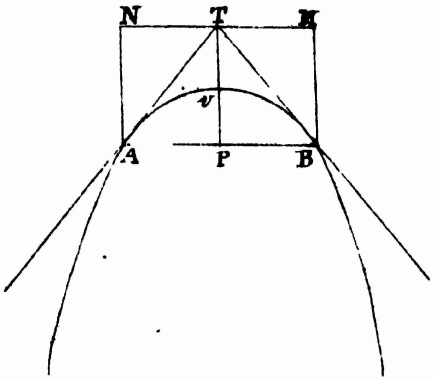
Q.—Describe a parabola with a given focus and touching a straight line at a given point?



A.—Let F be the given point, and AB the given straight line, and B a point in it. It is required to describe a parabola whose focus may be the given point F, and touching the straight line AB in the given point B. Join FB and make the angle ABC = ∠ ABF and make BC = BF. Through C draw FCDE perpendicular to BC. From F let fall FD perpendicular to FE. Now here the line FE is the directrix of the parabola required; for the parabola being described having F for a fixed point and FE for the fixed line, it is evident by the construction that that parabola will pass through the point B. And AB is a tangent to it, for AB bisects the ∠CBF contained by the perpendicular drawn from a point in the curve upon the directrix and by the ilne drawn from this point to the focus. Wherefore the required parabola is described.

Q.—Shew geometrically and analytically that the tangents at the extremity of any focal chord intersect each other at right angles in the

directrix, and that the line joining this intersection and the focus is perpendicular to the focal chord?



A.—Let AB be an ordinate. Let AT and BT be the two tangents drawn from two extremities of the ordinate AB.

Now NA BM is a four-sided figure, of which by Prob. (32) of Book I. Corollary I. of Euclid the 4 angles,

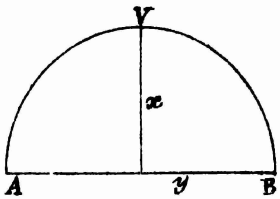
$$\text{ANM} + \text{ABM} + \text{BMN} + \text{NAB} = 4 \text{ right angles}$$
$$\text{or rt.} \angle + \text{ABM} + \text{rt.} \angle + \text{NAB} = 4 \text{ rt.} \angle\text{s}$$
$$\therefore \text{ABM} + \text{NAB} = 2 \text{ rt.} \angle\text{s}$$
$$\text{or } 2\,\text{TBA} + 2\,\text{TAB} = 2 \text{ rt.} \angle\text{s}$$
$$\therefore \text{TBA} + \text{TAB} = \text{a rt.} \angle$$

Now because the two $\angle$s TBA and TAB of the triangle ATB are together equal to one rt. $\angle$, therefore the remaining $\angle$TAB must be $\frac{1}{2}$ rt. $\angle$.

Q.—Find the area of a parabola?

A.—It is required to find the area of a parabola or the space enclosed by the curve and a straight line.

Let ABV = the space



Since the circumscribed rectangle of a parabola is provêd always to be $\frac{2}{3}$ of the parabola,

$$\therefore \text{area of parabola} = \tfrac{2}{3}\,x \times 2y$$
$$= \tfrac{4}{3}\,2xy$$

also $A = \int y$ when $y = f(x)$

Here $y^2 = 4\,mx = 2\,m^{\frac{1}{2}}\,x^{\frac{1}{2}}$

$$A = \int 2m^{\frac{1}{2}}\,x^{\frac{1}{2}} = 2m^{\frac{1}{2}} \int x^{\frac{1}{2}} = 2m^{\frac{1}{2}} \left(\frac{2\,x^{\frac{3}{2}}}{3}\right)$$

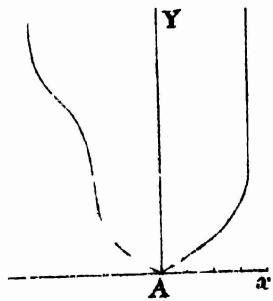
$$= \frac{4\,m^{\frac{1}{2}}\,x^{\frac{1}{2}}n}{3} = \frac{4xy}{3}$$

$$= \tfrac{2}{3}\ 2xy.$$

Q.—Trace the curve whose equation is $y^2 = \dfrac{x^3}{2\,a - x}$

A.— $y^2 = \dfrac{x^3}{2a - x}$

$$y = \sqrt{\frac{x^3}{2a - x}}$$



Let $x = o$, $y = o$, curve passes, through the origin.

$$x = a_1\ y = \sqrt{\frac{a^3}{a}} = a$$

$$x = \tfrac{1}{2}a_1\ y = \sqrt{\frac{\frac{a^3}{8}}{\frac{3}{2}a}} = \sqrt{\frac{\frac{a^2}{4}}{3}} = a\sqrt{\frac{1}{12}}$$

$$x = \tfrac{3}{2}a_1\ y = \sqrt{\frac{\frac{27}{8}a^3}{\frac{1}{2}a}} = a\sqrt{\frac{27}{4}} = \tfrac{3}{2}a\sqrt{3}$$

$$x = 2a_1\ y = \sqrt{\frac{8a}{o}} = \infty$$

$$x = -a_1\ y = \sqrt{\frac{-a^3}{3a}} \text{ an imaginary quantity,}$$

$$\left\{\begin{matrix} x = -\ 3a \\ x^3 = -\ 27a^3 \end{matrix}\right\} y = \sqrt{\frac{-27a^3}{-a}} = 3\,a\sqrt{3}$$

$$x = -\tfrac{5}{2}a_1 x^3 = \frac{125}{8}a^3,\ y = \sqrt{\frac{125}{4}}\,a^2 = a\sqrt{\frac{125}{4}}$$

$$x = -\tfrac{9}{4}a_1 x^3 = \frac{-809}{64}a^3 \therefore y = \sqrt{\frac{-809\,a^3}{\frac{64}{\frac{1}{4}a}}} = a\sqrt{\frac{809}{16}}$$

&c. &c. &c.

Though the curve is not well drawn in the figure, but it would be easily understood the manner in which it is traced out.

Q.—Express the sines of the several angles of a plane triangle in terms of the sides.

$$\text{A.—Sin A} = \frac{2}{bc}\sqrt{s\,(s-a)\,(s-b)\,(s-c)}$$

$$\text{Sin B} = \frac{2}{ac}\sqrt{s\,(s-a)\,(s-b)\,(s-c)}$$

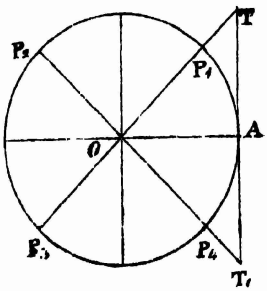
$$\text{Sin C} = \frac{2}{ab}\sqrt{s\,(s-a)\,(s-b)\,(s-c)}$$

where ABC, are the three ∠s and abc the three sides

and $s = \dfrac{a+b+c}{2}$

Q.—Trace the tangent through the four quadrants.

A.—The tangent is a straight line which touches the circle and as a trigonometrical function is always drawn at the commencement of the 1st quadrant, and terminated by a straight line drawn through the centre and the end of that arc.



Here AP represents the arc of all 4 conditions, but the positions of the Tangents are only two as AT and AT¹ For AT represents both the tangents of the 1st and 3rd quadrants for the line P_3OP_1T

passing through the centre cuts P_2 in the 3rd and P_1 in the 1st quadrant, and since all functions in the 1st quadrant are positive, therefore tangent of the 1st quadrant is positive. Again AT, represents tangents of the 2nd and 4th quadrants and may be illustrated as in the first case, and it is drawn in the opposite direction to that positive one, therefore it is negative; wherefore tangents in 2nd and 4th quadrants are negative.

Q.—Prove that the sum of any two sides of a triangle is to their difference as the tangent of half the sum of the ∠s opposite to those sides is to the tangent of half their difference: and explain the use of this proposition in the solution of triangles.

A.— $a : b :: \sin A : \sin B$

$$a + b : a - b :: \sin A + \sin B : \sin A - \sin B$$

$$\frac{a+b}{a-b} = \frac{\sin A + \sin B}{\sin A - \sin B}$$

$$= \frac{\sin\left(\frac{A+B}{2} + \frac{A-B}{2}\right) + \sin\left(\frac{A+B}{2} - \frac{A-B}{2}\right)}{\sin\left(\frac{A+B}{2} + \frac{A-B}{2}\right) - \sin\left(\frac{A+B}{2} - \frac{A-B}{2}\right)}$$

$$= \frac{\sin\frac{A+B}{2}\cos\frac{A-B}{2}}{\sin\frac{A+B}{2}\cos\frac{A+B}{2}}$$

Dividing by $\cos\frac{1}{2}(A+B)\cos\frac{1}{2}(A-B)$

$$= \frac{\dfrac{\sin\frac{A+B}{2}}{\cos\frac{A+B}{2}}}{\dfrac{\sin\frac{A-B}{2}}{\cos\frac{A-B}{2}}} = \frac{\tan\frac{A+B}{2}}{\tan\frac{A-B}{2}}$$

$\therefore a + b : a - b :: \tan\frac{1}{2}(A+B) : \tan\frac{1}{2}(A-B)$.

This problem is introduced in the solution of triangles of which two sides and the included angle are given.

Thus the included angle C being given we know

$$\frac{A+B}{2} = \frac{180^\circ - C}{2} = 90^\circ - \tfrac{1}{2}C$$

by the above proposition we have

$$\tan \tfrac{1}{2}(A-B) = \frac{a-b}{a+b} \tan \tfrac{1}{2}(A+B)$$

and thus a, b, and A + B, being known, A — B may be found also; thence we can find each of the ∠s A and B

$$\therefore A + B = 90^\circ - \tfrac{1}{2}C = m$$

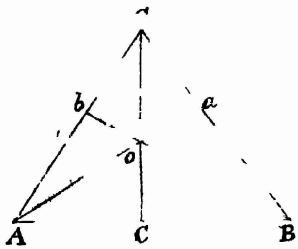
$$A - B = \text{----------} = n$$

$$\therefore 2A = m + n \quad \therefore A = \frac{m+n}{2}$$

$$2B = m - n \quad \therefore B = \frac{m-n}{2}$$

Q.—The sides of a plane triangle being given compare the radii of the inscribed and circumscribing circles.

A.—Let ABC be a triangle in which BO, AO, and CO are drawn, bisecting the ∠s at B, A and C. Let oc, ob, oa be perpendiculars on the three sides. Then by Euclid, these lines are the radii of the inscribed circle.



Let s = area of the whole △ ABC, then

$$s = \tfrac{1}{2}ar + \tfrac{1}{2}br + \tfrac{1}{2}cr = \tfrac{1}{2}r(a+b+c) = rB$$

Construction.—Every side being bisected, perpendiculars are raised, and the centre of intersection is the centre of the circumscribed circle.

$$AO = CO = BO = R$$

$$\text{Sin } A = \text{Sin } AOC = \frac{AC}{AO} = \frac{\frac{1}{2}a}{R} = \frac{a}{2R}$$

$$\text{Sin } B = \frac{b}{2R} \text{ and } \sin C = \frac{c}{2R}$$

$$\frac{a}{2R} = \sin A = \frac{2}{bc}\sqrt{s(s-a)(s-b)(s-c)}$$

$$= \frac{2}{bc}\, s \text{ or } s = \frac{abc}{4R} \therefore R = \frac{abc}{4S}$$

$$R : \frac{abc}{4S} :: r : \frac{S}{s}$$

$$R : r :: \frac{abc}{4S} : \frac{S}{s} :: abc. : s^2$$

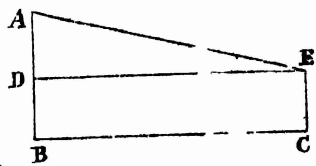
$$:: abcs : s(s-a)(s-b)(s-c)$$

$$:: abc : (s-a)(s-b)(s-c)$$

$$\text{where } \frac{R}{2} = \frac{abc}{(s-a)(s-b)(s-c)}$$

Q.—What angle will a pole 15 ft. high subtend at the distance of $\frac{1}{8}$ of a mile, the pole being erected on the same horizontal plane with the observer, the height of whose eye is 5 feet 6 inches.

A.—Let AB be the pole = 15 feet. Let C be the station where the observer stood. Let BC = $\frac{1}{8}$ of a mile.



$= \frac{1760}{8} = 220$ feet. Then CE the height of the eye of the observer = 5 feet 6 inches = 5·5 feet

Let ED be drawn parallel to CB.

Then AD = AB — DB = AB — CE = 15 — 5·5 = 9·5

Let θ be the $\angle$ which the pole subtends

$$\tan\theta = \frac{\sin\theta}{\cos\theta} = \frac{AD}{DE} = \frac{9{\cdot}5}{220} = 6{\cdot}431819$$

and by referring to Logarithms θ may be known

Q.—Find cos 5A in terms of cos A. cos 2A cos 3A. cos 4A.

A.—Cos 5A = cos (3 A + 2A)

= cos 3A cos 2A — sin 3A. sin 2A = cos 3A cos 2A —(sin 2A cos A + cos 2A sin A) sin 3A

= cos 3A cos 2A — (4 sin ^{2}A cos ^{3}A + 2 cos 2A cos A sin ^{2}A)

$$= \cos 3A \cos 2A - (4 \cos^3 A)(1 - \cos^2 A) + 2 \cos 2A \cos A (1 - \cos^2 A)$$

$$= \cos 3A \cos 2A - (4 \cos^3 A - 4 \cos^5 A + 2 \cos 2A \cos A - 2 \cos 2A \cos^3 A)$$

$$= \cos 3A \cos 2A - 4 \cos^3 A + 4 \cos^5 A - 2 \cos 2A \cos A - 2 \cos 2A \cos^3 A$$

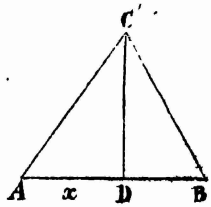
$$= \cos 3A \cos 2A - 4\cos^3 A + 4 \cos^5 A - 2 \cos A (2 \cos^2 A - 1) - 2 \cos^3 A (2 \cos^2 A - 1)$$

$$= \cos 3A \cos 2A - 4 \cos^3 A + 4 \cos^5 A - 4 \cos^3 A + 2 \cos A - 4 \cos^5 A - 2 \cos^3 A$$

$$= \cos 3A \cos 2A - 10 \cos^3 A - 2 \cos A.$$

Q.—Find an expression for the cosine of an angle of a triangle in terms of the sides of a triangle must necessarily be greater than the third.

A.—Case I. When the triangle ABC is an acute angled triangle.



From C let fall a perpendicular to AB

Let AD = x, then DB = c — x

$$\text{Cos } A = \frac{x}{b}; \; x^2 = AD^2 = AC^2 - CD^2$$

$$= AC^2 - BC^2 + BD^2$$

$$= b^2 - a^2 + (c - x)^2 = b^2 - a^2 + c^2 + x^2 - 2cx$$

$$\text{or } 2cx = b^2 + c^2 - a^2 \therefore \frac{x}{b} = \frac{b^2 + c^2 - a^2}{2bc}$$

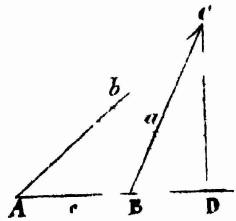
$$\text{wherefore } \cos A = \frac{x}{b} = \frac{b^2 + c^2 - a^2}{2bc}; \cos B = \frac{a^2 + c^2 - b^2}{2ac} \text{ and}$$

$$\cos C = \frac{a^2 + b^2 - c^2}{2ab}$$

Case II. Where the $\triangle$ ABC is an obtuse angled triangle; data as before.

$$\cos A = \frac{AD}{AC} = \frac{x}{b}$$

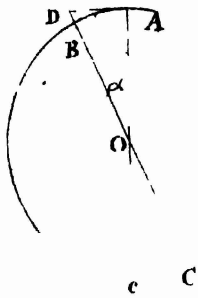
$$x^2 = b^2 - CD^2 = b^2 - a^2 + BD$$
$$= b^2 - a^2 + (x - c)^2$$
$$= b^2 - a^2 + x^2 - 2cx + c^2$$
$$\therefore 2cx = b^2 + c^2 - a^2$$
$$\frac{x}{b} = \frac{b^2 + c^2 - a^2}{2bc} = \cos A$$



and similarly for the others.

Q.—The diameter of the earth being 7912 miles find how high an object must be to be seen at the distance of 100 miles measured on the earth's surface?

A.—Let ABC be the circumference of the earth's surface of which O is the centre and A the station, and B 100 miles from A — AD is drawn a tangent — then BD = x is the height of the object visible at A.



By Euclid (III. 36)

$$CD.\ BD = AD^2$$
$$x\,(x + d) = AD^2$$
$$x^2 + dx = (r.\ \tan \alpha)^2$$
$$x^2 + dx = (r.\ \tan 1^0\ 25')^2$$
$$x^2 + dx + r^2 = r^2 + (r \tan 1^0\ 25')^2$$
$$= r^2 + r^2 \tan 1^0\ 25'$$
$$= r^2\,(1 + 0{\cdot}250216)^2$$
$$(x + r)^2 = 15649936\ (1{\cdot}000626351)$$

arc AB = a =

24856·339 whole = 360

100 = 1° 25′

$$(x + y)^2 = 15747959{\cdot}53 = {}^{*}3970 \text{ miles.}$$

$$\therefore x = 14 \text{ miles}$$

$x^2 + 7912x = 100^2$ nearly; for chord and arc in this case are nearly equal.

Q.—Prove that $\cos A = \dfrac{2}{\tan(45^0 + \frac{1}{2}A) + \cot(45^0 + \frac{1}{2}A)}$

A.—$\text{Cos } A = \cos^2\dfrac{A}{2} - \sin^2\dfrac{A}{2}$

$$= \frac{1 - \tan^2\frac{A}{2}}{\dfrac{1}{\cos^2\frac{A}{2}}} = \frac{1 - \tan^2\frac{A}{2}}{1 + \tan^2\frac{A}{2}} = \frac{1}{\dfrac{1 + \tan^2\frac{A}{2}}{1 - \tan^2\frac{A}{2}}}$$

$$= \frac{2}{\dfrac{1 + \tan^2\frac{A}{2} + 1 + \tan^2\frac{A}{2}}{\left(1 - \tan\frac{A}{2}\right)\left(1 + \tan\frac{A}{2}\right)}}$$

$$= \frac{2}{\dfrac{1 + \tan^2\frac{A}{2} + 2\tan\frac{A}{2} + 1 + \tan^2\frac{A}{2} - 2\tan\frac{A}{2}}{\left(1 - \tan\frac{A}{2}\right)\left(1 + \tan\frac{A}{2}\right)}}$$

$$= \frac{2}{\dfrac{\left(1 + \tan\frac{A}{2}\right)^2 + \left(1 - \tan\frac{A}{2}\right)^2}{\left(1 + \tan\frac{A}{2}\right)\left(1 - \tan\frac{A}{2}\right)}}$$

$$\frac{2}{\dfrac{\left(1 + \tan\frac{A}{2}\right)^2}{\left(1 + \tan\frac{A}{2}\right)\left(1 - \frac{\tan A}{2}\right)} + \dfrac{\left(1 - \tan\frac{A}{2}\right)^2}{\left(1 + \tan\frac{A}{2}\right)\left(1 - \tan\frac{A}{2}\right)}}$$

$$= \frac{2}{\dfrac{1+\tan\frac{A}{2}}{1-\tan\frac{A}{2}} + \dfrac{1-\tan\frac{A}{2}}{1+\tan\frac{A}{2}}}$$

$$= \frac{2}{\dfrac{\tan 45+\tan\frac{A}{2}}{1-\tan 45\tan\frac{A}{2}} + \dfrac{1-\tan 45\tan\frac{A}{2}}{\tan 45+\tan\frac{A}{2}}}$$

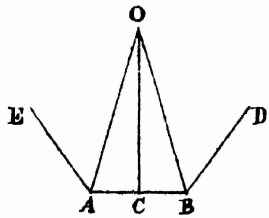
$$= \frac{2}{\dfrac{1+\tan\frac{A}{2}}{1-\tan\frac{A}{2}} + \dfrac{1}{\tan(45^0+\frac{A}{2})}}$$

$$= \frac{2}{\tan(45+\frac{A}{2}) + \cot\left(45+\frac{A}{2}\right)}$$

Q.—Express the area of a regular polygon of n sides, each side = a.

A.—Let EABD be a regular polygon of which O is the centre and AB a side = a, which is bisected in C, OC being evidently perpendicular.

The $\angle$ AOB = $\frac{360^\circ}{n}$ (n = number of sides)



$$AC = r \,.\, \sin\frac{180^\circ}{n} \quad \therefore\ r = \frac{Ac}{\sin\frac{180}{n}}$$

$$= \frac{a}{2\sin\frac{180}{n}}$$

$$OC = r \,.\, \cos\frac{180}{n} = \frac{a \,.\, \cos\frac{180}{n}}{2\sin\frac{180}{n}}$$

The area of $\triangle$ AOB $= \dfrac{AC \times OC}{2} = \dfrac{a^2 \cos 180}{2 \times 2 \sin \dfrac{180}{n}} = \dfrac{a^2}{4} \cot \dfrac{{}^2180}{n}$

and area of the whole figure = n times the area of the $\triangle$ AOB. Let S represent whole area,

$$\therefore S = \tfrac{1}{4}\, n a^2 \cot \frac{{}^2180^\circ}{n}$$

Q.—In any plane triangle ABC

$\cot A . \cot B + \cot A . \cot C + \cot B \cot C = 1$

A.—$\cot A \cot B + \cot A . \cot C + \cot B . \cot C =$

$$= \frac{\cos A . \cos B}{\sin A . \sin B} + \frac{\cos A . \cos C}{\sin A . \sin C} + \frac{\cos B . \cos C}{\sin B . \sin C}$$

$$= \frac{\cos A \cos B \sin C + \cos A \cos C \sin B + \cos B \cos C \sin A.}{\sin A \sin B \sin C}$$

$$= \frac{\sin (A + B + C) + \sin A \sin B . \sin C}{\sin A \sin B \sin C} = \frac{\sin A \sin B \sin C}{\sin A \sin B \sin C} = 1$$

Q.—State Napier's Rules for the solution of right angled spherical triangles. How are they proved? Apply them to the solution of the following spherical triangle.

$a = 97^\circ\ 29'$

$b = 104^\circ.\ 12'$

$C = 90^\circ$

A.—" The product of the radius and middle part sine
" Equal the tangents of those that combine—
" and to the consines of those that disjoin," &c.

By the rule

$R \sin c = \cos a . \cos b$

$\cos c = \cos a . \cos b$

$\cos c = \cos 97^\circ\ 29' . \cos 104^\circ\ 12'$

$\log \cos c = \log \cos 97^\circ.\ 29' + \log \cos 104^\circ.\ 12'$

$= 9{\cdot}99629 + 9{\cdot}98652 - 10$

$= 9{\cdot}98281 = \log \cos 16^\circ\ 1'$

$\therefore c = 16^\circ\ 1'$, and similarly the other parts may be deduced.

Questions in Mathematics and Natural Philosophy, proposed by Government to the Senior Class, Bareilly College, and Answers by Doorgapershaud.

Question.—Define the terms Explicit Function, Implicit Function, Algebraical Function, Transcendental Function, Differential Co-efficient.

Answer.—Explicit Functions are those in which the value of the function u is known in terms of the independent variable x.

$$\text{As } u = ax \pm b \text{ or } u = ax^2 \pm bx \pm C.$$

Functions are implicit when u and x are involved together. As $u^2 = ax^2 + ax$ or $u = ax^3 + u^2 x^2 - b$.

Algebraic functions are those in which the value of u is known by means of an equation consisting of a finite number of terms. As $u = x^m + mx^{m-1} a + m\left(\frac{m-1}{1 \cdot 2}\right) x^{m-2} a^2 +$ &c. where m is a finite number.

Transcendental functions are infinite series, the sum of which cannot be expressed by means of the Algebraic signs. As $\sin x = x - \frac{x^3}{1 \cdot 2 \cdot 3} + \frac{x^5}{1 \cdot 2 \cdot 3 \cdot 4 \cdot 5} -$ &c.

In the expansion $u_1 = u + Ah + Bh^2 + Ch^3 +$ &c. where u_1 is the value of u when x becomes $x + h$; ABC &c. are called Differential Co-efficients.

Q.—Find $\frac{du}{dx}$ when

$$u = \overline{a + x}\sqrt{a - x}$$

$$u = \frac{\sqrt{1 + x}}{\sqrt{1 - x}}$$

A.—$u = (a + x)\sqrt{a - x} = a\sqrt{a - x} + x\sqrt{a - x}$

$$\frac{du}{dx} = \frac{-a}{2\sqrt{a - x}} + \sqrt{a - x} - \frac{x}{2\sqrt{a - x}}$$

$$= \frac{-a + 2(a - x) - x}{2\sqrt{a - x}} = \frac{a - 3x}{2\sqrt{a - x}}$$

$$u = \frac{\sqrt{1+x}}{\sqrt{1-x}} \therefore \frac{du}{dx} = \frac{\frac{1}{2\sqrt{1+x}}\sqrt{1+x} + \frac{1}{2\sqrt{1-x}}\sqrt{1+x}}{1-x}$$

$$= \frac{\frac{\sqrt{1-x}}{2\sqrt{1+x}} + \frac{\sqrt{1+x}}{2\sqrt{1-x}}}{1-x} = \frac{\frac{1-x+1+x}{2\sqrt{1+x}\sqrt{1-x}}}{1-x} = \frac{1}{\sqrt{1+x}(1-x)^{\frac{3}{2}}}$$

Q.—Find $\frac{du}{dx}$ when

$$u = \frac{E^x - 1}{E^x + 1}$$

$$u = \log \frac{E^x - 1}{E^x + 1}$$

A.—$u = \frac{E^x - 1}{E^x + 1} \therefore \frac{du}{dx} = \frac{E^x(E^x+1) - E^x(E^x - 1}{(E^x+1)^2}$

$$= \frac{E^x(E^x + 1 - E^x + 1)}{(E^x+1)^2} = \frac{2\ E_x}{(E^x+1)^2}$$

$$u = \log. \frac{E^x - 1}{E^x + 1} = \log\ (E^x - 1) - \log(E^x + 1)$$

$$\frac{du}{dx} = \frac{E^x}{E^x - 1} - \frac{E^x}{E^x + 1} = \frac{E^x(E^x+1) - E^x(E^x - 1)}{E^{2x} - 1}$$

$$= \frac{E^x(E^x + 1 - E^x + 1)}{E^{2x} - 1} = \frac{2E^x}{E^{2x} - 1}$$

Q.—Find $\frac{du}{dx}$ when

$$U = \text{versin } x$$

$$u = \log. \sqrt{\frac{1 + \sin x}{1 - \sin x}}$$

A.—$u = \text{vers. } x = 1 - \cos x \therefore \frac{du}{dx} = \sin x$

$$u = \log. \sqrt{\frac{1 + \sin x}{1 - \sin x}} = \log \sqrt{1 + \sin x} - \log \sqrt{1 - \sin x}$$

$$= \tfrac{1}{2} \left\{ \log(1 + \sin x) - \log(1 - \sin x) \right\}$$

$$\frac{du}{dx} = \frac{1}{2}\left\{\frac{\cos x}{1+\sin x} - \frac{\cos x}{1-\sin x}\right\}$$

$$= \frac{\frac{1}{2}\cos x - \sin x \cos x - \cos x - \sin x \cos x}{1-\sin^2 x}$$

$$-\frac{1}{2}\frac{2\sin x \cos x}{1-\sin^2 x} = -\frac{\sin x \cos x}{\cos^2 x} = -\frac{\sin x}{\cos x} = -\tan x$$

Q.—Explain successive differentiation, and find the 4th differential co-efficient of sin x?

A.—In the expression $u = fx$ if $\frac{du}{dx}$ be found, then since it is capable of receiving an increment or decrement, it may again be differentiated, and this again a second time, and so on as far as we please. The process of differentiating these again and again is called successive differentiation. For example let p be the differential of $\frac{du}{dx}$

$$\text{Then } \frac{du}{dx} + \frac{d\left(\frac{du}{dx}\right)}{dx} + \&c. = p + \frac{dp}{dx}h + \&c.$$

$$\therefore \frac{d\left(\frac{du}{dx}\right)}{dx} = \frac{dp}{dx}$$

which means that $\frac{du}{dx}$ is differentiated a second time, and is written $\frac{d^2u}{dx^2}$

Let $u = \sin x$ find $\frac{d^4u}{dx^4}$

$$\frac{du}{dx} = \cos x, \frac{d^2u}{dx^2} = -\sin x, \frac{d^3u}{dx^3} = -\cos x, \frac{d^4u}{dx^4} = \sin x$$

Q.—Expand tan. x in terms of x by Maclaurin's Theorem to four terms.

A.—Let $u = \tan x$. Then if $x = o_1$, $u = o = U_o$

$\frac{du}{dx} = 1 + \tan^2 x$, and when $x = o$, $U_1 = 1$

$$\frac{d^2u}{dx^2} = 2\tan x(1+\tan^2 x) = 2\tan x + 2\tan^3 x, \text{ and when } x = o\ U_2 = o$$

$$\frac{d^3u}{dx^3} = 2(1+\tan^2 x) + 6\tan^2 x(1+\tan^2 x) = 2 + 8\tan^2 x + 6\tan^4 x$$

and when $x = o$, $U_3 = 2$

$$\frac{d^4u}{dx^4} = 16\tan x(1+\tan^2 x) + 24\tan^3 x(1+\tan^2 x)$$

$$= 16\tan x + 40\tan^3 x + 24\tan^5 x$$

$\therefore$ when $x = o$, $U_4 = o$.

$$\frac{d^5u}{dx^5} = 16(1+\tan^2 x) + 120\tan^2 x(1+\tan^2 x) + 120\tan^4 x(1+\tan^2 x)$$

$$= 16 + 136\tan^2 x + 240\tan^4 x + 120\tan^6 x$$

$\therefore$ when $x = o$ $U_5 = 16$

$$\frac{d^6u}{dx^6} = 272\tan x(1+\tan^2 x) + 960\tan^3 x(1+\tan^2 x) + \&c.$$

$$= 272\tan x + 1232\tan^3 x + \&c.$$

and making $x = o$ $U_6 = o$.

$$\frac{d^7u}{dx^7} = 272(1+\tan^2 x) + \&c. = 272 + 272\tan^2 x + \&c.$$

and when $x = o$, $U_7 = 272$

Now by Maclaurin's Theorem

$$u = U_0 + U_1 x + \frac{U_2 x^2}{1\cdot 2} + \frac{U_3 x^3}{1\cdot 2\cdot 3} + \frac{U_4 x^4}{1\cdot 2\cdot 3\cdot 4} + \frac{U_5 x^5}{1\cdot 2\cdot 3\cdot 4\cdot 5} + \&c.$$

$$\therefore u = \tan x = x + \frac{x^3}{1\cdot 3} + \frac{2x^5}{1\cdot 3\cdot 5} + \frac{17x^7}{1\cdot 5\cdot 7\cdot 9} + \&c.$$

Q.—Explain the method of determining by the differential calculus the maxima and minima values of functions of two independent variables; and the method of ascertaining whether the values obtained are maxima or minima.

A.—When a function of one variable is given to find its maximum or minimum value, we form an equation on one side of which we write the unknown quantity, involving some constant ones, and the word maximum or minimum on the other: and as the differential of a maximum or minimum is nought, by differentiating the above equation we get the unknown quantity involving its differential with some con-

stant quantities equal to o, and rejecting the differential and bringing the constant quantities on the other side we at once find the required value of the function.

To prove the Exponential Theorem.

$\therefore a^x = (1 + a - 1)^x = (1 + b)^x$ where $b = a - 1$

$$\therefore a^x = (1+b)^x = 1 + xb + x\left(\frac{x-1}{1\cdot 2}\right)b^2 + \frac{x(x-1)(x-2)}{1\cdot 2\cdot 3}b^3 + \&c.$$

By the Binomial Theorem

$$\begin{aligned} &= 1 + \left(b - \frac{b^2}{2} + \frac{b^3}{3} + \&c.\right)x \\ &\quad + \left(\frac{b^2}{2} - \frac{b^3}{2} + \&c.\right)x^2 \\ &\quad + \left(\frac{b^3}{1\cdot 2\cdot 3} + \&c.\right)x^3 \\ &\quad + \&c. \end{aligned}$$

let ABC &c. be the co-efficients of x, x^2 x^3 &c.

$\therefore a^x = 1 + Ax + Bx^2 + Cx^3 + Dx^4 + \&c.$

when $A = b - \frac{b^2}{2} + \frac{b^3}{3} - \&c. = (a-1) - \frac{1}{2}(a-1)^2 + \frac{1}{2}(a-1)^3$ &c

and BC &c. are functions of A.

$$\begin{array}{rl} a^x = 1 & + Ax + Bx^2 + Cx^3 + Dx^4 + \&c. \text{ for the same reason} \\ a^y = 1 & + Ay + By^2 + Cy^3 + Dy^4 + \&c. \\ a^{x+y} = 1 & + Ax + Bx^2 + Cx^3 + Dx^4 + \&c. \\ & \quad Ay + A^2xy + ABx^2y + ACx^3y + \&c. \\ & \qquad\quad By^2 + ABxy^2 + B^2x^2y^2 + \&c. \\ & \qquad\qquad\quad Cy^3 + ACxy^3 + \&c. \\ & \qquad\qquad\qquad\quad + Dy^4 + \&c. \end{array} \left.\vphantom{\begin{array}{l}1\\1\\1\\1\\1\\1\\1\end{array}}\right\} \text{By Multiplication.}$$

and $a^{x+y} = 1 + A(x+y) + B(x+y)^2 + C(x+y)^3 + D(x+y)^4 + \&c.$

By the expansion.

Now since the co-efficients of like quantities are equal, we have the co-efficient of $x + y$ equal to that of $x + y$ in both equations.

$\therefore A = A$, $2B = A^2$ or $B = \frac{A^2}{1\cdot 2}$

$$3C = A.B \therefore C = \frac{A.B}{3} = \frac{A}{3}\cdot\frac{A^2}{1\cdot 2} = \frac{A^3}{1\cdot 2\cdot 3}$$

2

$$4D = A.C \therefore D = \frac{A.C}{4} = \frac{A}{4} \cdot \frac{A}{1 \cdot 2 \cdot 3} = \frac{A^4}{1 \cdot 2 \cdot 3 \cdot 4}$$

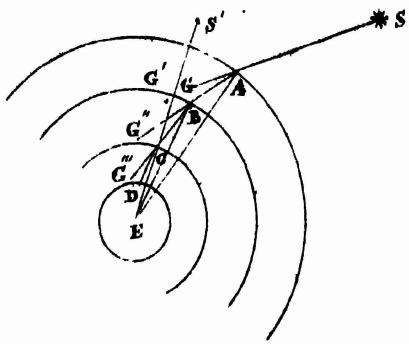
&c. &c.

$$\therefore a^x = 1 + Ax + \frac{A^2 x^2}{1 \cdot 2} + \frac{A^3 x^3}{1 \cdot 2 \cdot 3} + \frac{A^4 x^4}{1 \cdot 2 \cdot 3 \cdot 4} + \text{\&c.}$$

Q.—Explain what is meant by refraction, and how it affects astronomical observations?

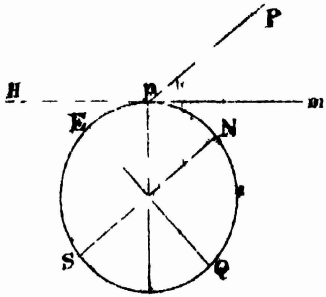
A.—When the rays of light pass from a rarer medium into a denser one, or from a denser into a rarer one, it is found that they are broken from, or bent out of their course at the common section of the two mediums.

This breaking of the rays of light is called refraction, the effect of which is to increase the apparent altitude of the heavenly bodies, being greatest when the object is near the horizon and least when it is near the zenith. As the air surrounding the earth is of different densities at different heights from its surface, it is evident that a ray of light coming from a heavenly body, and passing through the different strata of the air which are of different densities will be refracted at every point of its course. Now as the density of the air varies at every point, therefore a ray of light passing through it will describe a curve, and as the eye sees an object in the direction of the rays coming from it, therefore it will by the effect of refraction see the object in the direction of the tangent to the curve described by the refracted ray. To illustrate this by a figure, let AG G′ G″ G‴ be the strata of the air of different densities, let S be an object and let a ray AG be incident at the point A, then since it passes from a rarer into a denser medium it will go between the perpendicular AE, and its original direction AG, that is, in AB. Again when AB falls upon B, it will for the same reason go in the direction BC, and BC will be bent in the direction CD. Now, if there be an eye at D, it will see the object in the direction DCS′, that is, refraction increases the apparent altitude of S.



Q.—Show that the altitude of the elevated pole represents the latitude of the observer's position?

A.—Let NS be the axis of the earth, EQ the equator, and let P be the place of an observer, then Hpm is the plane of horizon. Now P representing the Celestial Pole Ppm is its altitude, but since pP is parallel to NS, and pC meets them, the angle PpC is equal to the angle pCS, take away the equal angles mpC and ECS, therefore the remaining angles Ppm and pCE are equal; but the former is the altitude of the pole, and the latter the latitude of the place p, therefore the altitude of the celestial pole is equal to the latitude of the place of the observer.

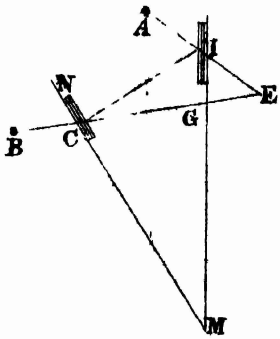


Q.—Describe the construction and use of the Transit Instrument?

A.—The transit instrument is a telescope fixed at right angles to a cross axis which is placed on horizontal supporters. The object glass of the telescope has 3 or 5 wires placed parallel to and at equal distances from one another. There is another moveable wire placed at right angles to the abovementioned wires. The transit instrument is of great use in astronomy, as it is employed in determining the meridian of a place.

Q.—Describe the construction and use of the Sextant?

A.—The construction of the sextant is as follows. Take two mirrors I and N, the upper half of the latter of which is transparent, and fix them at the ends of the wooden rods CM and MJ, and let one of these rods CM be moveable about M, and let the mirrors be perpendicular to the plane passing through IM and CM. Now, suppose A and B are two objects, the angular distance of which is required. Place the eye at the point E in the plane of IM and MN and look through the transparent part of the mirror N at the object B. Now direct the mirror I towards and continue to look through the mirror N until HI a ray from A after two reflections coincide with the ray BC coming from B. Then by the principle of reflection the angle AIN is equal to the angle NIM, and



the angle ICN equal to the angle ECM. Now the angle BCI minus the angle CIE is equal to the angle E; that is, twice the angle NCI minus twice the angle CIM equal to the angle E, but the angle NCI minus the angle CIM is equal to the angle M, therefore the angle E is twice the angle M, that is, the angle contained by the directions of the mirrors. Consequently, if the space between I and N be marked with degrees, minutes, &c., and a telescope be fixed at G, this will prove a very good instrument for measuring the angular distance of two objects.

Q.—What are the principal sources of error in Astronomical observations ?

A.—The motion of the earth, that of the objects upon which the observations are made, and which are moving with different velocities, the aberration of light, and the effect of refraction are the principal sources of error in astronomical observations.

Q.—By what means is the figure of the earth ascertained ?

A.—As it is found that the altitude of the polar star varies as the latitude, that is, if we advance a degree or any aliquot part of a degree north or south of the equator, on a meridian we cause the same difference in the altitude of the pole, therefore as that cannot take place without the figure of the earth being spherical or nearly so, we ascertain the figure of the earth. Therefore if we measure the distance we have gone over to make an alteration of one degree in the altitude of the pole we will be able to determine the circumference of the earth by multiplying the distance measured by 360.

Q.—Mention the methods commonly employed for determining terrestrial longitudes.

A.—As we know that by the rotation of the earth the sun passes over 15° of longitude in one hour or 1° in 4 minutes, therefore from hence it is manifest that a place one degree east of another will have the sun sooner on its meridian than the latter place. Now as the longitude of a place is the distance of its meridian of a given place reckoned on the equator, it is evident that if the difference between the time of these places be found, the longitude of the first place will be determined. Now there are various means to find this difference, but the most commonly used is the following. Provide two chronometers, one corrected for the time of Greenwich, from which we reckon the terrestrial longitudes of places, and one corrected for the time of the place of which the longitude is to be found, and as these two will show the difference of time between the two places, the longitude of the latter will be determined, alloting a difference of one degree of longitude to a difference of 4 minutes of time, and this longitude will be east or

west according as the time of Greenwich is less or greater than that of the place of which the longitude is required.

Q.—What is meant by the Aberration of Light ?

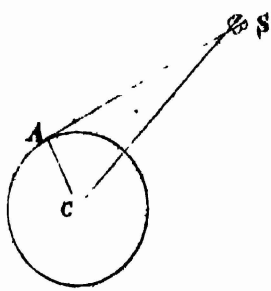
A.—As the light of the stars takes some time in its passage to reach the surface of the earth, and as the earth also advances some distance in its orbit during that time, the combined effect of these two velocities, that is, of the light of a star and of the motion of the earth, causes an apparent change in the position of the stars, and is called the Aberration of Light.

Q.—How are the changes of the Season explained ?

A.—The earth moves in an orbit nearly circular, and the sun is situate in one of its foci. This axis of the earth being inclined at an angle of $23\frac{1}{2}°$ to the plane of its orbit is a principal cause of the change of the seasons. For as the axis is inclined the north pole is sometimes turned towards the sun, and sometimes the south pole, so that when the north pole is turned towards the sun the rays of the sun fall perpendicularly on the northern hemisphere, but obliquely on the southern; therefore the hot season prevails in the northern and the cold in the southern hemisphere; but when the sun is at the equinoxial point the line of light and darkness passing through the pole equally divides our globe, and therefore neither is there much cold nor much heat.

Q.—How is the distance of the earth from the sun ascertained?

A.—Let S be the sun, AC a radius of the earth, observe the parallax of the sun, that is, the angle which AC the radius of the earth subtends at the sun. Join CS, AC; then in the △ ACS the angle S is known and the angle C is known, and one side AC is known, therefore CS may be determined.



Q.—Describe the phenomenon of a lunar eclipse.

A.—The lunar eclipse is caused when the moon passes through the shadow of the earth. As the earth is smaller than the sun, it is

evident that it will cast a conical shadow. Now as the moon's orbit intersects the ecliptic at angle of 5° therefore when the moon comes in opposition, the conical shadow of the earth is sometime below and sometimes above the moon, and therefore she is not eclipsed at every opposition. But when the opposition takes place, when the moon is in her node, that is, the point in which the moon's orbit and the ecliptic intersect each other, a lunar eclipse takes place. The limit of a lunar eclipse is 17° that is, if in opposition it is 17° of its node, a lunar eclipse takes place. The duration of the lunar eclipse depends upon the distance of the moon, and the apparent diameters of the sun and moon by which the breadth of the shadow at the place where the moon passes it is determined.

Q.—What are Kepler's Laws?

A.—Kepler's laws are that the planets move in ellipses, that the radius vector describes equal areas in equal times, and that the cubes of the distances of the planets are as the squares of the times of describing their orbits.

Q.—What is supposed to be the structure of comets?

A.—The comets are supposed to consist of matter which is susceptible of undergoing change, as they are hotter than red-hot iron when near the sun, and very cold when distant from the sun.

Q.—What do we know with regard to the distance of the fixed stars?

A.—The fixed stars are at a very great distance from the earth, for even the diameter of the earth's orbit does not subtend at any of them any perceptible angle.

Q.—What effect has the form of the earth on the weight of bodies at different parts of the earth's surface, and how is this effect ascertained?

A.—As the earth is protuberant at some places and depressed at others, it is evident that the distance of its centre from various points on its surface varies, therefore since the attraction on the earth varies inversely as the squares of the distances from the centre, therefore the attraction at various places is different, and this difference of attraction, or of weight is ascertained by means of the pendulum.

Q.—Show that Sec. A $= \frac{1}{1 - \text{vers A.}}$

A.— r being 1, $\frac{\text{Sect A}}{1} = \frac{1}{\cos A} = \frac{1}{1 - \text{vers}A}$ ∴ Sect A = $\frac{1}{1 - \text{vers A}}$.

Q.—Given, 2 sin A = tan A to find the values of A.

A.— $2 \sin A = \tan A = \frac{\sin A}{\cos A}$ and dividing both sides of the equation by sin A, $2 = \frac{1}{\cos A}$ or $\cos A = \frac{1}{2}$ ∴ A = 60° or 120°

Q.—Find the expression for the sine and cosine of A in terms of the sine and cosine of 2A.

A—Since $\sin 2A = 2 \sin A \cos A$.

and $1 = \text{Cos}^2 A + \sin^2 A$.

$1 + \sin 2A = \text{Cos}^2 A + 2 \sin A \cos A + \sin^2 A$.

$\cos A + \sin A = \pm\sqrt{1 + \sin 2A}$

similarly $\cos A - \sin A = \pm\sqrt{1 - \sin 2A}$

$\therefore \cos A = \frac{1}{2} (\pm \sqrt{1 + \sin 2A} \pm \sqrt{1 - \sin 2A}$

and $\sin A = \frac{1}{2} (\pm \sqrt{1 + \sin 2A} \mp \sqrt{1 - \sin 2A}$

Q.—Prove that $\sin A - \sin B = 2 \cos \frac{A + B}{2} \sin \frac{A - B}{2}$

A.—Since the greater of any two numbers is equal to half the sum plus half the difference, and the less equal to half the sum minus half the difference, we have $A = \frac{A + B}{2} + \frac{A - B}{2}$

and $B = \frac{A + B}{2} - \frac{A - B}{2}$

$$\therefore \sin A = \sin \left(\frac{A + B}{2} + \frac{A - B}{2}\right)$$

$$= \sin \frac{A + B}{2} \cos \frac{A - B}{2} + \text{Cos} \frac{A + B}{2} \sin \frac{A - B}{2}$$

$$\text{and } \sin B = \sin\left(\frac{A+B}{2} - \frac{A-B}{2}\right)$$

$$= \sin \frac{A+B}{2} \cos \frac{A-B}{2} - \text{Cos} \frac{A+B}{2} \sin \frac{A-B}{2}$$

$$\therefore \sin A - \sin B = 2 \cos \frac{A+B}{2} \cdot \sin \frac{A-B}{2}$$

Q.—Find tan 4A in terms of tan A.

$$\text{A.—Tan } 4A = \tan (2A + 2A) = \frac{2 \tan 2A}{1 - \tan^2 2A}$$

$$\text{but } \tan 2A = \frac{2 \tan A}{1 - \tan^2 A}$$

$$\therefore \tan 4A = \frac{2\left(\frac{2 \tan A}{1 - \tan^2 A}\right)}{1 - \left(\frac{2 \tan A}{1 - \tan^2 A}\right)^2}$$

$$= \frac{\frac{4 \tan A}{1 - \tan^2 A}}{\frac{1 - 2\tan^2 A + \tan^4 A - 4 \tan^2 A}{(1 - \tan^2 A)^2}}$$

$$= \frac{(4 \tan A)(1 - \tan^2 A)}{1 - 6 \tan^2 A + \tan^4 A}$$

$$= \frac{4 \tan A - 4 \tan^3 A}{1 - 6 \tan^2 A + \tan^4 A}$$

Q.—Explain the method by which the arithmetical value of sin 1′ is obtained.

A.—Sin 30 being known, we find the sin $\frac{30}{2}$ by means of the following formula.

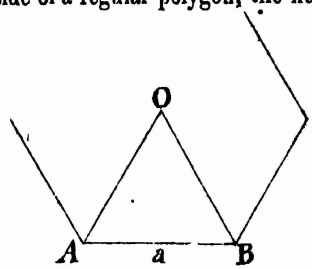
$$\text{Sin } A = \tfrac{1}{2} (\pm \sqrt{1 + \sin^2 A} \mp \sqrt{1 - \sin^2 A.})$$

And sin $\frac{30°}{2}$ being calculated, we find the sin $\frac{30°}{2^2}$ by means of

the same formula, and continuing the same process, we at last obtain the sin of an angle which is less than a minute. Now, as the sines of very small angles are proportional to the angles themselves, we find by this proportion the sine of a minute, the sine of less than a minute being known by the method described above.

Q.—Find a general expression for the area of a regular polygon in terms of the sides ; and apply the formula to the determination of the area of a square, a hexagon and an octagon, the side of each being 12.

A.—Let AB = a be the side of a regular polygon, the number of whose sides is n



The $\angle$ AOB $= \dfrac{360^\circ}{n}$

and $\angle$ AOa $= \dfrac{180^\circ}{n}$

The area of the $\triangle$ AOB

$= \frac{1}{2}$ ABOa $= \frac{1}{2}$ a · Oa

but Oa $=$ Aa · cot $\dfrac{180^\circ}{n} = \frac{1}{2}$ a cot $\dfrac{180}{n}$

$\therefore \triangle AOB = \frac{1}{4} a^2 \cot \dfrac{180^\circ}{n}$

and the area of the given polygon $= \frac{1}{4}\, na^2 \cot \dfrac{180^\circ}{n}$

Let S, H and O, be the areas of a square, a hexagon, and an octagon, the side of each being 12.

Then $S = \frac{1}{4} \,.\, 4 \times 12^2 \,.\, \cot \dfrac{180^\circ}{4} = 12^2 \,.\, \cot 45^\circ = 12^2 = 144$

$$H = \tfrac{1}{4} \,.\, 6 \times 12^2 \,.\, \cot \frac{180^\circ}{6} = \frac{3}{2} \,.\, 12^2 \,.\, \cot 30^\circ = 3 \times 72\sqrt{3}$$

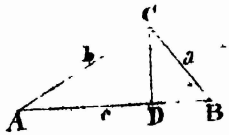
$$= 216\sqrt{3}$$

and $O = \frac{1}{4} \,.\, 8 \times 12^2 \cot \dfrac{180^\circ}{n} = 2 \times 144 \cot 22\frac{1}{2}^\circ = 288 \,.\, \cot 22\frac{1}{2}^\circ$

Q.—Express a side of a triangle in terms of the remaining sides and their opposite angles.

A.—Let ab and ∠s A and B be given to find C

$$2bc \cos A = b^2 + c^2 - a^2$$



$$2ac \cos B = a^2 + c^2 - b^2$$

$$2bc \cos A - 2ac \cos B = 2\,(b^2 - a^2)$$

$$(b \cos A - a \cos B)\, C = b^2 - a^2$$

$$\therefore C = \frac{b^2 - a^2}{b \cos A - a \cos B}$$

Q.—Find an expression for the tangent of half of one of the angles of a triangle in terms of the sides

A.—$\text{Sin}\ \frac{A}{2} = \frac{\sqrt{1 - \cos A}}{2}$

and $\cos \frac{A}{2} = \frac{\sqrt{1 + \cos A}}{2}$ but

$$1 - \cos A = 1 - \frac{b^2 + c^2 - a^2}{2bc}$$

$$= \frac{2bc - b^2 - c^2 + a^2}{2bc}$$

$$= \frac{a^2 - (b^2 - 2bc + c^2)}{2bc}$$

$$= \frac{a^2 - (b^2 - c)}{2bc}$$

$$= \frac{(a + b - c)\,(a + c - b)}{2bc}$$

let $a + b + c = 2s$

then $a + b - c = 2\,(s - c)$

and $a + c - b = a\,(s - b)$

$$\therefore 1 - \cos A = 2\,(s - b)\,(s - c)$$

and $1 + \cos A = 1 + \frac{b^2 + c^2 - a^2}{2bc}$

$$= \frac{2bc + b^2 + c^2 - a^2}{2bc}$$

$$= \frac{(b+c)^2 - a^2}{2bc}$$

$$= \frac{(b+c-a)\ (a+b+c)}{2bc}$$

but $b + c - a = 2\ (s - a)$

and $a + b + c = 2\ s$

$$\therefore 1 + \cos A = \frac{2s\ (s-a)}{bc}$$

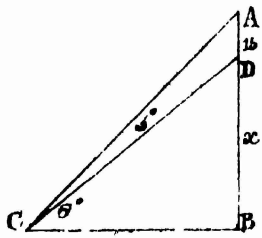
$$\therefore \sin \frac{A}{2} = \frac{\sqrt{2\ (s-b)\ (s-c)}}{2bc}$$

$$= \frac{\sqrt{2\ (s-b)\ (s-c)}}{bc}$$

$$\text{and } \cos \frac{A}{2} = \frac{\sqrt{s\ (s-a)}}{bc}$$

$$\therefore \frac{\sin \frac{A}{2}}{\cos \frac{A}{2}} = \tan \frac{A}{2} = \frac{\sqrt{2\ (s-b)\ (s-c)}}{s\ (s-a)}$$

Q.—At a distance of 200 feet from the foot of a tower, an object 15 feet high on the top of the tower subtends an angle of 3° find the tower's height.



A.—Let $BD = x$

$\angle DCB = \theta$

$$x + 15 = 200 \tan (\theta + 3^\circ)$$

$$x = 200 \,.\, \tan \theta$$

$$15 = 200 (\tan (\theta + 3^\circ) - \tan \theta)$$

$$\frac{15}{200} = \frac{a}{b} = \frac{\tan \theta + \tan 3^\circ}{1 - \tan \theta \tan 3} - \tan \theta$$

$$\therefore a - a \tan \theta \,.\, \tan 3^\circ = b \tan 3^\circ + b \,.\, \tan 3^\circ . \tan^2 \theta$$

$$\tan^2 \theta + \frac{a}{b} \cdot \tan \theta = \frac{a - b \tan 3^\circ}{b}$$

$$\tan\theta = \frac{\sqrt{a^2 + 4\ ab - 4\ b^2 \tan 3^\circ} - a}{2b}$$

$$= \frac{46.8}{400}$$

$$AB = 200\ .\ \tan\theta = \frac{200 \times 46 \cdot 8}{400}$$

$$= 23 \cdot 4 \text{ feet}$$

Q.—Define the terms Mass, Density, Gravity, Weight, Specific Gravity?

A.—Mass is the quantity of matter that a body contains. Density is the number of particles contained in a given space. Gravity is a force which attracts all bodies towards the centre of the earth, and is estimated by their weight which is its effect. Specific gravity is the ratio between equal bulks of two bodies of different densities.

Q.—State the three laws of Motion, or Newtonian axioms as they are called?

A.—The first law of motion is, that a body in motion will continue to move uniformly with that velocity which was originally given to it, as long as there is nothing to check or impede its progress. The second is, that the motion produced will be according to the force which produces it. And the third law is, that a body struck by another body will return the blow with the same force with which the second body struck it, that is, the action and re-action are equal.

Q.—What is Force?

A.—Force is a cause which produces or tends to produce motion, or which produces or tends to produce rest.

Q.—How can Forces be represented by straight lines, and the relations of several forces by geometrical figures? And what is the use of thus representing them?

A.—In order to facilitate calculations we assume straight lines proportional to the given forces and also represent their relations by geometrical figures. For instance, if two forces of 5 and 6 lbs. be given, in order to facilitate the operations, we assume a line of 5 units to represent the force of 5 lbs., and a line of 6 units to represent that of 6 lbs., or we take those lines such that their lengths shall be proportional to 5 and 6. And the use of thus representing the forces is, that, by this means we can apply the principles established by Geometry and Trigonometry to the theory of forces, and can deduce rules for calculating them which it would otherwise be impossible to discover.

Q.—Resolve a given force into two others whose sum or whose difference shall be always equal to a given quantity.

A.—Let the given force a be resolved into two forces, whose sum is s, and which act at an angle = A to find the forces.

Let x and y be the forces.

$$x + y = s$$
$$x^2 + y^2 + 2xy \cos A = a^2$$
$$x^2 + 2xy + y^2 = s^2$$
$$2xy\,(1 - \cos A) = s^2 - a^2$$
$$\text{or } 2xy = \frac{s^2 - a^2}{1 - \cos A}$$
$$x^2 + 2xy + y^2 = s^2$$
$$4xy = 2 \cdot \frac{s^2 - a^2}{1 - \cos A}$$
$$\therefore (x^2 - 2xy + y^2) = (x - y)^2 = 2s^2 - \frac{s^2 - a^2}{1 - \cos A}$$
$$\text{or } x - y = \pm\sqrt{\frac{2s^2 - 2s^2 \cos A - s^2 + a^2}{1 - \cos A}} = \pm\sqrt{\frac{a^2 - 2s^2 \cos A + s^2}{1 - \cos A}}$$

and $x + y = s$.

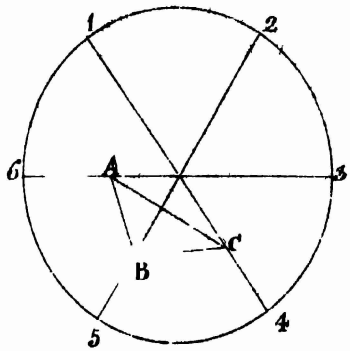
$$x - y = \pm\sqrt{\frac{a^2 - 2s^2 \cos A + s^2}{1 - \cos A}}$$
$$\therefore x = \frac{s \pm \sqrt{\frac{a^2 - 2s^2 \cos A + s^2}{1 - \cos A}}}{2}$$
$$\text{and } y = \frac{s \pm \sqrt{\frac{a^2 - 2s^2 \cos A + s^2}{1 - \cos A}}}{2}$$

Now let $x - y = d$ Then in the same manner

$$x^2 + y^2 + 2xy \cos A = a^2$$
$$x^2 - 2xy + y^2 = d^2$$
$$2xy\,(1 + \cos A) = a^2 - d^2$$
$$2xy = \frac{a^2 - d^2}{1 + \cos A}$$
$$x^2 - 2xy + y^2 = d^2$$
$$4xy -$$

Left out, there being no time to finish it.

Q.—On the circumference of a circle whose diameter is 10 are placed six weights of 1, 2, 3, 4, 5, 6 lbs respectively in the order named, at intervals of 60°. Find the common centre of gravity.



A.—Let x be the distance between 4 and the centre of gravity of 1,

$1 : 4 :: x : 10 - x.$

$x = 2$

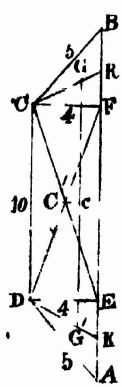
In the same manner,

$$2 : 5 :: x : 10 - x \text{ or } x = \frac{20}{7}$$

$$3 : 6 : 1 : 2 :: x : 10 - x \text{ or } x = \frac{10}{13}$$

and the points ABC being thus determined, we can find the centre of gravity of ABC, which is not found on account of there being no time.

Q.—A trapezoidal board, (the lengths of the parallel sides being 10 and 16, of the other sides 5 each), is suspended freely from one extremity of the longest side. Find the inclination of each side to the horizon when it comes to rest.



A.— $CF \text{ or } DE = \sqrt{25 - 9} = \sqrt{16} = 4$

$$GR = \frac{1}{3} CR = \frac{1}{3} CF$$

$$= \frac{4}{3} = G^1k$$

and the common centres of gravity of the two triangles BFC and ADE is half way between G and G', that is, at c; and the centre of gravity of CE is at C', the intersection of the two diagonals FD and C'E, and consequently the centre of gravity of the whole figure is between c and C', and the sum of the areas of two small triangles is $4 \times 3 = 12$ and the area of $CE = 10 \times 5 = 50$.

Let x be the distance between c and the centre of gravity of the whole trapezoid

$$12 : 50 :: x : \tfrac{7}{6} - x \qquad \begin{aligned} C'c &= 2\tfrac{1}{2} - \tfrac{4}{3} = \\ &= \tfrac{5}{2} - \tfrac{4}{3} = \tfrac{7}{6} \end{aligned}$$

and thus the centre of gravity of the figure being found the plumb-line hung from B will pass through it, and will be perpendicular to the horizon, and therefore complements of the angles made with this line and the side will be the angles made with the horizon.

Q.—A body falling freely passed altogether over three times the space described in the last second of its fall. How long was it falling, and what space did it pass over ?

A.—Let t be the time of its fall.

Then $\frac{1}{2}g\,(2t - 1)$ = the space described in the last second of its fall, and $\frac{1}{2}g\,t^2$ = the whole space described in the time t.

Therefore by the question $\frac{1}{2}g\,t^2 = \frac{1}{2}g\,.\,3\,(2\,t - 1)$

$$t^2 = 6t - 3 \text{ or } t - 6t = -3$$

and $t^2 - 6t + 9 = 6$ or $t - 3 = \pm\sqrt{6}$

$\therefore t = 3 \pm \sqrt{6} = 5.4494$ or $.5506$

$$s = \tfrac{1}{2}g\,t^2 = \frac{193}{12}(9 + 6\sqrt{6} + 6) = \frac{193}{12}(15 + 6 \times 2.4494)$$

$$= \frac{193}{4}(5 \times 2.4494) = \frac{193}{4}(5 + 4.8988 = \frac{193}{4} \times 9.8988$$

$$= 193 \times 2.4747 = 477.6171 \text{ feet}$$

$$\text{or } s = \frac{193}{12}(9 - 6\sqrt{6} + 6) = \frac{193}{12}(15 - 6\sqrt{6})$$

$$= \frac{193}{4}(5 - 2\sqrt{6})$$

$$= \frac{193}{4}(5 - 4.8988) = \frac{193}{4} \times .1012 = 193 \times .0253$$

$$= 4.8829 \text{ feet.}$$

Q.—Describe the method of determining the weight that can be sustained by a given floating body, the depth to which it is to be immersed being limited?

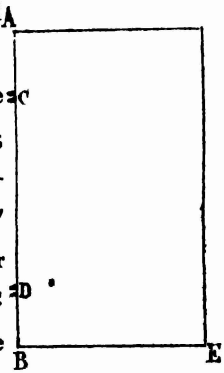
A.—Let the floating body be immersed in water to a certain depth by adding a weight to it, it is required to determine the weight added. After being immersed the compound will evidently displace as much water as is equal in bulk to the portion sunk, and the weight of the water displaced will be equal to the weight of the compound, the weight added will be equal to the weight of the water displaced minus the weight of the body, and since the water displaced is equal in bulk to the part immersed, therefore the weight of the water displaced may easily be determined.

Q.—An open cubical vessel, each side 4 feet, is filled with water to a height of 3 feet. Find the pressure on the base and on the sides?

A.—The pressure on each side is equal to half the pressure on the base, but the pressure on the base is equal to the whole weight of the contained water $= 4^2 \times 3 \times 1000 = 48000$ ounces $= 3000$ lbs. $\therefore$ the pressure on each side $= 1500$ lbs; and consequently the pressure on all the sides $= 6000$ lbs.

Q.—Show that the velocities with which water issues from similar orifices at different depths in the side of the containing vessel are as the square roots of the depths?

A.—Let C and D be two similar orifices in the side AB of the containing vessel AE. It being supposed that the vessel is always kept full, it is evident that the velocity at C or D is equal to the velocity acquired by falling through AC or AD; but since the velocities are as the times of acquiring them, therefore we have $v : v' :: t : t'$ where v and v' denote the velocities at C or D and t and t' the times of falling through AC or AD. And as the times are as the square roots of the spaces fallen through $\therefore v : v' ::$



$\sqrt{AC} : \sqrt{AD}$

Q.—How is the elasticity of the air shown by experiments?

A.—The elasticity of the air is proved by various experiments. As soon as the pressure of the air is removed from the external surface

of a closed bladder, the air which is within it expands by its elasticity and distends the bladder. The pressure of the external air being removed from some part of our body causes the air within to expand and make the part swell.

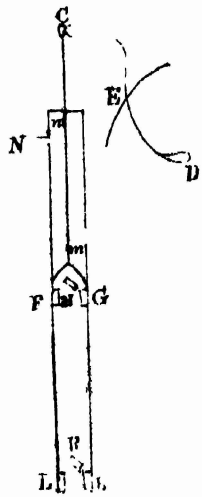
Q.—Can a perfect vacuum be made by means of the air-pump? If not, why not?

A.—A perfect vacuum can never be made by means of the air-pump. Because a certain quantity of the air being drawn from a receiver in the first stroke, the remaining quantity expands and fills the receiver and the barrel of the pump; a certain quantity being removed in the second stroke, the remainder expands and again fills the receiver and the barrel. In this manner although the density of the air within the receiver is reduced in geometrical progression, there is never produced a perfect vacuum, because there is always drawn out a part of the remainder at every stroke.

Q.—Describe the action of the different kinds of pump for raising wate?

A.—There are three sorts of pumps, viz., the sucking, the lifting, and the forcing pump. The following is a section of the sucking pump.

AB is a hollow cylinder made of metal and for very common purposes of wood, and made very smooth within. FG is a moveable piston exactly fitting the barrel and made water-tight, so that no water can pass between it and the sides of the barrel. The piston has an opening furnished with a valve H, which opens only upwards, it is connected to the rod MC, the end of which C is fixed to the lever CD, the fulcrum of which is at E, LB is a plug containing an orifice R, the valve of which also opens upwards. Now when C the end of the rod CM is pressed down by means of the lever CD, the air within FB which by its pressure keeps the valve shut escapes through the valve H, and when the piston is raised, the remaining air within FB spreads through the whole barrel, and as this air is rarer than the external air, the valve R opens upwards and allows the air within the water



to fill the barrel. This air is again taken out by pressing down the piston H, and when after a certain number of strokes, the air within the barrel is nearly exhausted, the water having no pressure of the air upon its surface rises in the barrel and the piston being moved up and down it fills the barrel and then flows through the hole N. The action of the other pump is much nearly on the same principle.

Q.—Describe the construction of the barometer, and explain its application to the measurement of heights?

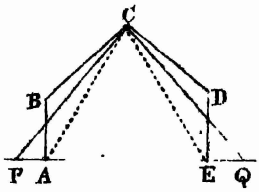
A.—Provide a hollow glass tube closed at one end, and about 32 inches in length, fill it with mercury, and having held the open end with the finger, invert it into a cup having a small quantity of quicksilver. Then as a small portion of the mercury will fall within the basin, there will be made a vacuum in the upper part of the tube. Now it is found that a column of mercury between 28 and 31 inches in height is equal in weight to a column of the air standing upon an equal base, so that according to the state of the weather, the mercury within the tube rises and falls between 28 and 31 inches, its greatest height being 31 inches, and its least at 28. Therefore the space between 28 and 31 is divided into degrees, which show the density and rarity of the atmosphere at different times. Now as the air is heavier at the surface of the earth than at some distance from it, the barometer is applied to measure the heights of mountains, because the density of the air at the bottom of a mountain or some other eminence compared with the density at the top will furnish us means to ascertain its height.

ANSWERS OF ROORKEE STUDENTS.

Answers by Hurree Churn.

Q.—Show how to reduce any rectilineal figure to a triangle.

A.—Let ABCDE be a rectilineal figure to be reduced to a triangle.

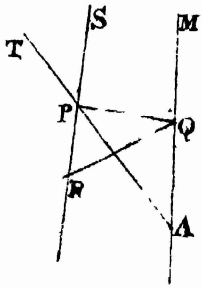


Join AC and CE, draw from B and D lines BP and DQ parallel to AC and CE respectively, then join PC and CQ. (P and Q being the points of intersection of the lines BP and DQ with AE produced both ways). The triangle PCQ will be equal to the rectilineal figure ACDE for AC parallel to BP the two triangles ABC and APC are equal to one another. In the same manner the $\triangle$, ECQ = $\triangle$ EDC $\therefore$ $\triangle$ PCQ = the rectilineal figure ABCDE.

Q.—Describe the construction of the sextant.

A.—The principle of its construction is this.

That the deviation of a ray from its first course after being reflected from two inclined mirrors is equal to twice the angle of inclination of the mirrors.



Let SP be a ray from a luminous body S and on the mirror AT, PQ the reflected ray, and QR the final direction of the ray after second reflection.

Let SPT = θ = QPA

PQM = RQA = θ_1 and A

the angle of inclination of the two mirrors AT and AM

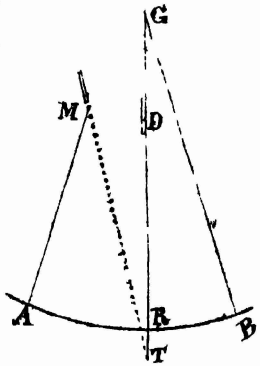
$$\text{and } QRP = SRQ - RQP \qquad \begin{cases} \text{Now } A = PQM - APQ \\ \qquad\quad = \theta_1 - \theta \end{cases}$$

$$= 180 - 2\theta - (180 - 2\theta_1) = 2(\theta_1 - \theta)$$

$$= QA.$$

The sextant consists of a circular segment AB (see Fig. I.) graduated into degrees and minutes.

A moveable line GT is provided with a glass at D, and facing to a glass at M fixed on the limb AM; the lower part of the latter glass is silvered and the upper half is plain; when the moveable limb is at B, the two glasses become parallel to each other. As the limb CT moves towards A, the two glasses become more and more inclined to each other the inclination at any point as R = (MTG = RGB) is indicated by the length of the arc BR.



Number of degrees contained in BR will be equal to half the deviation of a ray from its original course when reflected by these two mirrors.

To save the trouble of Multiplication, half degree is marked by one degree, and half minute by one minute, &c. to give at once the deviation of a ray. At the extremity of the moveable limb GT is attached a vernier scale by which as far as ten seconds can be read off pretty accurately.

Q.—How is iron obtained and prepared for use in the arts: explain the distinction between wrought and cast iron.

A.—Iron is obtained from iron ores in a state unfit for any direct use being mixed with mud, and many other foreign substances; it is freed from its impurities by a process called smelting, which consits in exposing it to a strong fire kept up burning vigorously by bellows or fans, the melted iron is poured into holes or moulds of sand, and allowed to become cold and hardened.

In this state it is called pig iron, and used for many purposes. Cast iron is prepared by remelting the pig iron. It is of great use and value in the arts for its being easily moulded into any desired shape.

There are two chief varieties of this iron, the white and gray, the former is more brittle and possesses more metallic lustre than the latter. The several other kinds of this iron intermediate between the white and the gray possess more or less of the qualities of the two varieties as they closely resemble the one or the other in colour and formation

of their grains. Wrought iron is prepared by successively heating the cast iron and beating it by hammers in its hot state. The process is continued till all its impurities are burnt off and fibres begin to form.

The distinction between wrought and cast iron is, that the former is fibrous, and the latter is granular. Cast iron is brittle and less dense than the other. Only the upper coating of cast iron is strong; when that is worn off it no longer can resist attrition and very easily becomes useless by wear and tear. It is also subject to air bubbles, for which it is rejected in many constructions, and wrought iron is used in its stead. Wrought iron is equally strong throughout, its entire depth being more condensed than cast iron; it is preferred to cast iron where toughness is indispensable. Wrought iron can be drawn out into threads, and any desired form can be given to it by passing it under a heavy roller having a cut on its surface similar to the form that should be given to the wrought iron.

Q.—Explain for what reasons experiments on models do not furnish correct data for ascertaining the strength of the structures which the models represent.

A.—The reason is that the variations of the strength of a body and its weight are not governed by the same law.

Strength varies as $\frac{B \times D^2}{L}$

while the weight varies $L \times B \times D$

If all the dimensions be doubled

Strength would be $\frac{2\,B \times 4\,D^2}{2L} = \frac{4\,B\,D^2}{L}$

And the weight $2\,B \times 2\,D \times 2L = 8\,B\,D\,L$

That is, by doubling all the dimensions strength will be four times, and the weight will be eight times.

Q.—Mention the distinctive features of Grecian and of Gothic architecture.

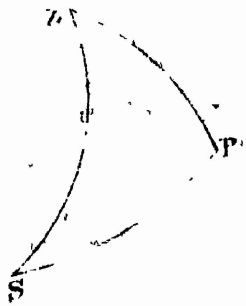
A.—Grecian architecture is distinguished by its horizontal mouldings and ornaments, triangular pediments, triglyphs and metops in its entablature, bold appearance of the Doric, voluted capital of the Ionic, and foliated capital of the Corinthian Columns.

Gothic architecture is distinguished by its perpendicular ornaments and traceries, mullions long slender, but grooped supports to pointed arches, and the triangular appearance of the arch.

Answers by Kunhya Lall.

Q.—Prove that when a heavenly body is six hours from the meridian, sine of the altitude is = sine of declination × sine of latitude.

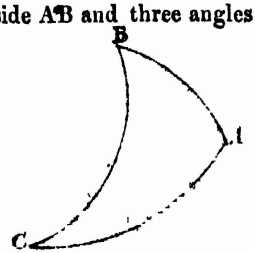
A.—Let Z be the zenith of the place, P the pole, and S the heavenly body; ∠ ZPS = 90°
ZP = co-latitude of the place
ZS = co-altitude of the body
PS = its co-declination.



Then according to Napier's Rules sin (90°—ZS) = cos. ZP cos. SP or cos. ZS = cos. ZP cos. SP *i. e.*, cos. of co-latitude = cos. of co-altitude × cos. of co-declination ∴ sin of altitude = sin of latitude × sin declination.

Q.—A side AB of a large triangle in a trigonometrical survey is 136352·16 feet and the connected angles are: A = 70° 56′ 42″·198. B = 59° 4′ 5″·655. C = 49° 59′ 16″·799. Find the other sides and the area, assuming the Earth's diameter to be 7920 miles.

A.—Here let ABC be the triangle, the side AB and three angles are given.



We have 136352·16 = 25·82 miles, and as a degree on the Earth's surface = 69·5 miles, we have the space of 25·82 miles = 0° 22′ 17″·43, and then we have in the triangle ABC $\frac{\sin a}{\sin b} = \frac{\sin A}{\sin C}$ or log sin a

= log sin 22° 17′·43 + log sin 70° 56′ 42″·198 — log sin 49° 59′ 19″·799
= 7·811154 + 9·975524 — 9·884173 = 7·902505
= log sin 27′ 28″·19

∴ a = 0° 27′ 28″·19 = 168000·0067 feet;
similarly b = 0° 24′ 53″·30 = 152212·0690.

Now for the area of the $\triangle$; we have twice the area

$$= \frac{A + B + C - 180}{180} \times 2\pi r^2$$

$$= \frac{\cdot 0012917}{180} \times 6.2832 \times 15681600$$

$$= \cdot 0012917 \times 6.2832 \times 87120$$

$$= 112.5329 \times 62\cdot 232$$

$$= 707\cdot 0667 \text{ square miles}$$

$\therefore$ The area = 353.53335 square miles.

In the preceding page, I have taken the length of a degree at 69.5 miles, which is generally assumed so, but if the length of a degree be taken at 69·115 miles, as is found from the data given is question, then

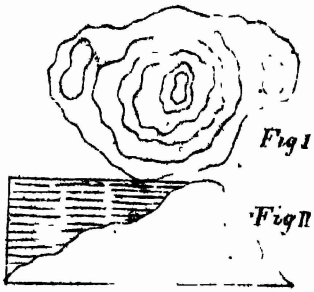
$$a = 168258\cdot 9$$
$$b = 152065\cdot 1$$

Q.—Explain the method of tracing contour lines.

A.—Supposing a hill covered to its top with water, and supposing the water to subside *m* feet every day, then the line tracing the edge to water in contact all round with the side of the hill is called a "contour line;" and it is obvious that this line is throughout on one level plane; hence the method of tracing contour lines consists in finding all such lines as are on one and the same level throughout their length, the vertical height at which such lines are apart from one another, being assumed to be one foot or 2 feet or any quantity.

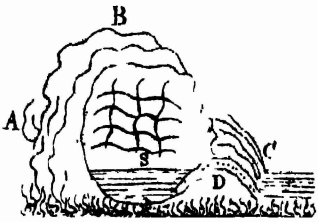
Then in order to trace the contours of a hill we should commence either from its top or bottom (suppose we commence from the bottom), and after driving a peg at some convenient point we should place a levelling instrument there, and with the aid of the levelling rods find all such points, round the hill, over which the reading on the rod is equal to the height of the instrument, and after driving pegs at those points we should make a station mark at each; after this we should lower the vane by the assumed common interval between each pair of contour lines, and find all such points over which the mark on the vane coincides with the horizontal wire of the telescope, and then lower the vane by the same quantity; after this we should take our instruments to any one of the last set of stations, and repeat the same operations there and so on, till the top of the hill is reached. After this work is done, we should survey each set of stations separately by a theodolite, and then the field work is done.

We should then put our field work on paper, first of all, the first set of stations should be plotted, and then the second, and so on, and a figure like that below will be formed. After this the section of the hill should be drawn which will show the height of such contour line below the base or bottom, as well as the height of the hill itself. Of the annexed figures, Fig. I. is a plan of the contour lines, and Fig. II. a section of the hill.



Q.—What are intermitting springs, and how are they accounted for?

A.—Intermitting springs are those which flow at one time and cease at another, and then, after a certain space of time begin to flow again and so on. In the following figure, ABC is a hill, S a basin of water in the interior of it, the thick lines represent the fissures or cracks in the hill through which water from the hill gathers in the cavity S, the dotted line represents a larger fissure or crack communicating to the basin S and debouching the waters of the basin on the plains. When the level of water in the basin attains the level of D the greatest height of the crack, then the water from the basin flows in the direction of the dotted line and continues to flow till the whole of the water in the basin S is exhausted and then the spring ceases; when the water again collects in the cavity or basin S and reaches the level of D, the spring again begins to flow and so on. The fissures shown by the dotted line act on the principal of the *syphon* and thus intermitting springs are accounted for.



Q.—Mention the several circumstances on which the pressure of earth on the back of retaining walls depends?

A.—The pressure of earth on the back of retaining walls depends on the height of the earth, its angle of repose, its weight, its cohesive force, its moist or dry state, and its being surcharged with a separate weight over it. By the height of the earth is meant the height of the embankment; this height is generally made equal to the height of retaining walls, but sometimes it is made to exceed the height of such walls.

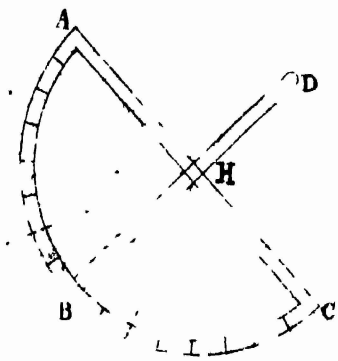
Q.—What circumstances determine the width of land required for a railway?

A.—The width of land required for a railway depends on the following things: 1st, the width proposed between the two rails; 2nd, the railway having a single or double line of rails; 3rd, the proposed space to be left between the exterior rails and the edge of the embankment; 4th, the proposed space to be left between the two lines of rails (if the railway consists of a double line of rails); 5th, the angle at which the kind of soil (upon which the railway goes) would stand; 6th, the width of the side drains. Of the 1st, 3rd and 4th are generally made equal to 4′ 8½″, 4′ 3″ or 4′ respectively, and the 5th is then the principal circumstance which determines the width of land required for a railway. The 6th itself depending upon the 5th is made to vary from three to four feet at the bottom.

Q.—Describe the method adopted in building elliptical arches (as lately used in the Goruckpore district) for obtaining the direction of the joints of the masonry?

A.—The method adopted was on the principal of the normal at any point bisecting the angle between the focal distances at that point.

Upon this principle a short instrument in the form of a semicircle with a large handle was contrived by the Secretary of the Local Committee at Goruckpore, and two ends of a larger string were fastened in the foci of the arches; and the instrument was moved round till the angles on each side of the handle made by the string were equal, and then the direction of the handle was the direction of the joint. The following figure represents the instrument:



ABC is the semicircle, graduated to degrees: DH, the handle; the dotted lines show the directions of the string.

At whatever point the direction of the joint is required, the instrument is placed there and moved round H as a centre, till the angles on both sides of the handle made by the string are equal, and the joint is made in the direction of the handle at that time.

Q.—What is the nature of the principal difficulty encountered in carrying a road over marshy ground, and what measures are resorted to in such situations? Give a specification, showing the mode in which you would direct such a work to be constructed.

A.—The principal difficulty encountered in carrying a road over marshy ground is to obtain a firm sub-soil for the road, to keep the road surface free from wet, and to ensure a perfect drainage. These objects are attained by first draining the marshy ground, and then laying bundles o fascines over the drained surface.

After the surface of the marsh is drained, large fascines or bundles of long twigs and branches of trees tied together are first laid in the direction of the road, and then other bundles of the same sort of twigs are placed over the first ones in a direction at right angles to the length of the road; when so much is done, then a layer of a kind of good tenacious earth is placed over those fascines, the thickness of the layer varying from 2 to 3 feet; this layer is to be well rammed and hardened; after this the road covering material is laid in thin and uniform layers well beaten and hardened. A road formed in such a manner is called a road resting on a brush foundation.

Required Specification.—The marshy ground over which the road is to go, is first to be drained thoroughly, and then scooped out to the depth of two or three feet and its place filled with a good kind of earth. After this, fascines (consisting of straight and strong twigs of a length greater than the total breadth of the road by 4 or 5 feet, and of such trees and shrubs as are liable to suffer less from wet) to be laid first in the direction of the length of the road, and then at right angles to it, and after this a layer of good hard tenacious earth about 2 or 3 feet thick, to be laid over the fascines, the layer to be well rammed and beaten so as to render the whole one rigid mass, not liable to be shaken from the motion of carriages passing over the road. When this is done, the road covering material to be laid in these layers to be thinner at the sides, and thicker in the middle, so as to make the transverse section of the road assume the figure of a semi-ellipse. The layers of the road covering material not to be less then six inches thick at the sides, and one foot in the middle, if the road is thirty (30) feet wide.

Q.—The ratio of the distance to the difference of longitude between two places on the same parallel of latitude varies in different latitudes. State and explain the ratio of this variation.

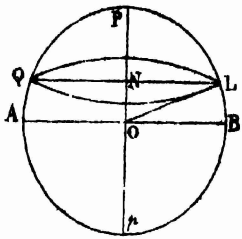
A.—The distance between two places on the same parallel of latitude is to the difference of their longitudes, as the cosine of the latitude is to unity. This is proved thus:

Let APBp represent the earth, AB the equator LNO parallel to it. OB = OL = R, and BL = L; then we have

NL = OL cos OLN.

= OL cos LOB.

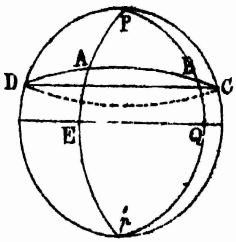
= R cos L,



therefore R cos L : R :: circumference of a circle radius LN : circumference of a circle radius BO.

or cos. L : 1 :: circumference of circle, radius NL : circumference of circle, radius OB.

Now let AB be any two places on the same parallel of latitude CABD, and let EQ be the equator, P the pole, PAE, PBQ, meridian circles, through A and B and let BQ = L, then we have AB : EQ :: the circumference of the circle of which AB is an arc : the circumference, circle of which EQ is an arc :: cos L : 1, as proved above, therefore the distance AB between the places A B, is to EQ, the difference of their longitudes as the cos of the latitude is to unity.



This ratio diminishes towards the poles, for as the latitude increases, its cosine diminishes till at the pole the latitude becomes 90, the cosine of which is o. Therefore in different latitudes, the distance between two places on the same parallels of latitude are to one another, as the cosines of their latitudes.

Q.—Explain for what reasons experiments on models do not furnish correct data for ascertaining the strength of the structures, which the models represent?

A.—Experiments on models do not furnish accurate data for ascertaining the strength of the structures which they represent, because the strength of a piece, length L breadth B depth D is as $\frac{BD^2}{L}$ and its

weight as BDL, and if all the dimensions be doubled, the strength would become $\frac{2B, 4D^2}{2L}$ or $\frac{4B\ D^2}{L}$ and the weight would be 2B. 2D. 2L or 8B. DL, and hence we see that if the dimensions of a piece be doubled, its strength increases four times, whereas its weight increases eight times; now in models, the pieces being small, their weight does not much affect the strength, but in large structures, the weight of the structures has a great influence upon their strength.

Besides the above reason, there is another, which is, that the pieces in the model being small, can be obtained free from knots and other defects, but in a large structure, the several pieces of which it is composed, can seldom be obtained free from its defects.

Q.—Mention the kind of artificial foundations in most frequent use, and explain on what they depend for their stability and efficiency?

A.—The kinds of artificial foundations in most frequent use are the following:

1. Timber piles; 2. Iron piles; 3. Sand piles; 4. Foundation laid on a bed of concrete; 5. Wells or blocks of masonry.

The first, second and third kinds are used, when the soil is of an incompressible nature, but yields to a lateral motion, and also when it is of a marshy or boggy nature.

When timber and iron piles are used, the area to be occupied by the building is first enclosed on all sides by a row of sheeting piles, and then if the soil is of a marshy kind, other piles are driven over the whole area, to render the soil more condense. If the principal piles upon which the weight of the structure rests are driven so deep as to rest upon a bed of kunker or compact clay, the building will be stable, for its weight is transmitted by means of piles to the firm ground below which will not yield to any pressure.

When timber piles are driven, their ends are first sharpened and sometimes iron shoes are placed on them; and the heads of the piles are embraced by an iron hoop, that they may not split from the force of the rammer.

Sand piles prove of great value when the soil is of an yielding kind, for they not only communicate the weight of the structure to the solid stratum below, but also press upon the sides.

They are driven, timber piles are first driven, and then taken out, and in the holes left by them sand is filled and rammed. Sand piles depend for their stability on the incompressible character of

sand. When there is a great fear of the settlement of the building from the yielding nature of the ground, piles are dispensed with, and layers of concrete are laid in the trenches dug for the foundation; each layer after being laid is well rammed and rendered hard, and then another layer is laid; in this manner the trenches are filled for the depth of 4 or 5 feet, and then regular masonry is commenced.

This sort of foundation depends for its stability and efficiency upon the character of the concrete, which when hardened forms a sort of pudding stone, and becomes all one solid mass, so that if any settlement takes place in the building, it will be uniform. The best kind of artificial foundation is formed by sinking wells or blocks of masonry; these are either sunk down to the depth of solid strata, or left suspended in sand, they are used when the subsoil is nothing but sand to great depths; and after they are sunk the first eight or ten feet of their heights their sinking further becomes very tedious, laborious, and expensive; for at the depth of eight or ten feet the pressure of sand against their sides is so great as to prevent their further sinking down.

These depend for their stability on the friction and pressure of sand against their sides, and on their reaching sometimes to the depth of a solid stratum either kunker or compact clay.

When a building rests upon insolated supports as a bridge upon its piers, inverted arches are turned to connect the piers with each other, so that the pressure upon the piers may also be communicated to the ground lying under the space between them.

QUESTIONS IN SHAKESPEARE'S MACBETH PROPOSED TO THE SENIOR CLASS, AGRA COLLEGE, AND ANSWERS BY E. HUTTON.

I.—*Lady M.* "*Alack! I am afraid they have awak'd and 'tis not done: th' attempt and not the deed confounds us: Hark! I laid their daggers ready. He could not miss them. Had he not resembled my father as he slept, I had done 't. My husband!*"

QUESTION.—What is going on while these words are being uttered? What is the meaning of "the attempt and not the deed confounds us?" Is there any touch in this passage which seems to show that Lady Macbeth had to struggle with her natural feelings in satisfying her ambition? If you remember others in the play, mention them; and give your own opinion of Lady Macbeth's character.

ANSWER.—Macbeth went into Duncan's chamber and killed him, and as he was returning one of the grooms who guarded the door of the chamber laughed in his sleep, and afterwards repeated a short prayer, and the other said, *Amen:* hearing a voice Lady Macbeth thought to herself that some one had awaked and that the murder of Duncan had not been effected. "The attempt and not the deed confounds us:" By this passage Lady Macbeth means to say that she does not care for the death of Duncan so long as herself and her husband are not discovered in the act of doing so.

In this passage the touch which seems to show that Lady Macbeth had to struggle with her natural feelings in satisfying her ambition is contained in these words; "Had he not resembled my father as he slept, I had done it." Another passage; "I have given suck and know how tender 'tis to love the babe that milks me; I would while it was smiling in my face, have plucked the nipple from its boneless gums and dashed its brains out had I sworn to it as you have done to this." As represented in this play Lady Macbeth seems to be of a bold and undaunted spirit (but at the same time cruel), and an ambitious and hard-hearted woman, a bad queen, and a wicked and unfeeling mother.

II.—*Macbeth.* "*Blood hath been shed ere now i' the olden time, Ere human statute purged the gentle weal, Aye and since too murthers have been performed: too terrible for the ear: the times have been that when the brains were out the man would die, and there an end: but now they rise again, with twenty mortal murthers on their crowns and put us from our stools. This is more strange than such a murther is.*"

Q.—What is the meaning of "Ere human statute purged the gentle weal?" To what does Macbeth allude when he says, "but now they rise again with twenty mortal murthers on their crowns?"

and why "push us from our stools?" Briefly describe the whole of this banquet scene.

A.—"Ere human statute purged the gentle weal," that is, before a statute or law was issued prohibiting the punishment by the rack. Macbeth alludes to the ghost of Banquo (which went and sat in his seat at the banquet) when he says "but now they rise again with twenty mortal murthers on their crowns." By the twenty mortal murthers on his crown he meant the twenty trenched gashes which the murderer said he had given him.

"Push us from our stools," because the ghost of Banquo came and sat in Macbeth's chair and would not allow him to sit in it. When Macbeth became king he gave a grand feast to the lords and gentlemen of his court, in the evening all the lords were present except Banquo (who was killed) and Fleance his son (who had escaped and ran away). As soon as Macbeth was going to take his seat he saw Banquo's ghost in it, at the sight of it he starts, and utters the words contained in the passage given in the question. At this Rosse, one of his courtiers, told the rest of the lords to rise as Macbeth was not well, but Lady Macbeth told them to keep their seats, and to eat on, because Macbeth from his youth was subject to such fits, and that this fit would go off in a moment, and then returning to Macbeth she reproached him for his weak-mindedness, but finding that he grew still worse, she told all the lords to go away without order. A short time after the ghost of Banquo disappears and Macbeth recovers."

III. Q.—How did Birnamwood come to Dunsinane, and what was the end of Macbeth?

A.—Macbeth went to the heath (where he met the witches a second time,) to know whether they had any more prophetic greetings for him. He finds them in a cave going round a cauldron filled with ingredients for a charm. The witches show him an apparition which told him that he would not be overcome till Birnamwood should come to Dunsinane. Another apparition also appears and tells him that he would not be overcome by any of woman born. The first prophecy was fulfilled by the troops of Macduff who marched through Birnamwood, (each carrying a branch of a tree in his hand), and went to Dunsinane, and the branches of the trees appeared as if the whole wood had come to Dunsinane.

The second prophecy was fulfilled in Macduff, who was not born in a natural way, but was taken out of his mother's side. Macduff and Macbeth both came against each other and fought, but at last Macduff killed Macbeth. Macbeth died cursing the witches who had prophesied in such an unknown manner.

QUESTIONS IN MILTON'S PARADISE LOST, PROPOSED TO THE SENIOR CLASS, AGRA COLLEGE, AND ANSWERS BY R. FORREST.

I.—*Book the 1st.*

> "As when the potent rod
> Of *Amram's son* in Egypt's evil day
> *Waved* round the coast, up-called a pitchy cloud
> Of locusts, *warping* on the eastern wind,
> That o'er the realm of impious Pharaoh hung
> Like night, and darkened *all the land of Nile.*"

QUESTION.—Who was "Amram's son?" What part of the verb is "waved?" What is the meaning of "warping?" What is the "land of Nile?" and what is the particular propriety of calling this country by one river?

ANSWER.—Moses, the celebrated lawgiver of the Jews, was the son of Amram: he was born in Egypt during the captivity of the Israelites there. The king of Egypt, apprehensive of the daily increasing numbers of the Israelites, had ordered that all the first-born males from the time of this decree were to be put to death. Moses' mother concealed him for about three months, but she at last made a cradle or basket, and covering it with pitch, she laid the helpless infant in it, and left him on the banks of the Nile, to be carried off when the river rose. It happened that Pharaoh's daughter coming with her maidens to bathe in the river, saw this little *ark*. Impelled by curiosity she sent one of her attendants to see what it was, she took the infant with her to her royal palace, where he was brought up in all the learning of the Egyptians. He was, however, kept from their idolatrous practices by the influence of his mother who had been appointed his nurse. It is needless relating the scriptural account of Moses any further how he was obliged to leave Egypt and kept Jethro's sheep, whose daughter he married; how he saw the burning bush, received his *potent rod*. How he brought the twelve plagues on Egypt, one of which was the flock of locusts alluded to here, and brought the children of Israel through the waters of the Red Sea, which opened before them when his rod was held over it, and closed over the pursuing chariots and horsemen of Pharaoh. He led the Israelites through the wilderness, but was himself prevented from entering the promised land, for having struck the rock in the wilderness, and he died on the borders of Canaan.

"Waved," past participle of the verb to "wave," agreeing with "rod."

"Land of Nile," Egypt, which is a long narrow valley situated on both sides of the *Nile*.

Because the Nile is the only river in Egypt, rain hardly ever falls in Egypt, and it is only the Nile annually overflowing its banks that fertilizes the country. For the river leaves behind it a thick black slime when it returns to its proper channel, in which grains grows with great rapidity, so that Egypt was long called the "granary of the world."

"Warping" expresses the meaning of coming in great numbers, with large breaks and openings between the bodies of locusts.

II.—*Book the 2nd.*

1st. "In discourse more sweet,
(For eloquence the soul, song charms the sense),
Others apart sat on a hill retired."

Q.—Enlarge the meaning of the middle line a little, showing briefly, the different provinces of eloquence and music.

2nd. "Nor was his ear less pealed
With noises loud and ruinous (to compare
Great things with small) than when Bellona storms
With all her battering engines bent to raze
Some capital city."

What do "Bellona" and her "Engines" mean? Do you remember any mention of gunpowder in the four books you have read?. What does the word raze "mean?" and what is its compound form which occurs every day in common conversation?

A.—After the council of the devils broke up, they all betook themselves to different means of amusement. Some employed themselves in athletic games, &c., while some sat apart on a hill holding sweet discourse with one another, for as music charms the ear, so does eloquence charm the understanding. Music addresses itself to our senses, while eloquence enraptures our minds. Milton knew the powerful effect music has, and in his L'Allegro he uses the following beautiful expression, describing music as an antidote of sorrow. "Lap me in Elysian dirs." Music chiefly leads to cheerful thoughts, but is a powerful instrument to awaken great and noble thoughts. Warriors are led to battle with the sound of music, and Dryden well describes its effect in the celebrated Ode to St. Cecilia's Day. Eloquence is another powerful instrument to stir up the hearts of men with. The generals of antiquity always harangued their soldiery before engaging with the enemy—a powerful speaker can persuade his auditors to the most heroic deeds, and, if a bad man, he may induce them to commit deeds of the most outrageous violence.

In ancient mythology, Bellona was represented as the goddess of war and sister to Mars. "*Her Engines*" mean the engines of warfare, and by them are here understood *cannons*, which are employed in battering down the walls of a besieged city. "Raze," to level with the ground. We now use the word "*erase*," to scratch out, &c., as when a blot of ink is *erased* from *the paper*. "Do you remember any mention of gunpowder in the four books you have read?" Yes, in the fourth book. When Gabriel was informed by Uriel, of

some bad angels having alighted on the earth, he directed Zephon and Ithuriel to keep watch *inside* of the garden of paradise, lest the intruding spirit might do Adam and Eve some harm. Proceeding accordingly to the bower, these two angels discovered Satan "squat as a toad" at Eve's ear, instilling vain imagination into her mind. Ithuriel touched him with his spear, when Satan started up into his proper shape. And here the Poet introduces the simile of a spark lighting on a heap of gunpowder stored up, and the consequent explosion.

III.—*Book the 3rd.*

1st. "Thus with the year
Seasons return, but not to me returns
Day, or the sweet approach of even or morn,
Or sight of vernal bloom, or summer's rose,
Or flocks or herds, or human face divine."

Q.—Why did not these return to Milton Take this occasion to mention any thing you remember of Milton's life?

2nd. "Round he surveys and well might when we stood
So high above the circling canopy
Of night's extended shade from *Eastern point*
Of Libra to the *fleecy star* that *bears*
Andromeda far off *Atlantic Seas.*
Beyond the horizon."

What do the last three lines mean? "Libra" and the "fleecy star," &c.?

A.—Because Milton was blind, as he says, "so thick a drop serene hath quenched the orbs" or "dim suffusion veiled."

Milton was born in London about the beginning of the 17th century. He was sent to study at Oxford, but his father being a papist, and as his principles inclined to the side of the puritans, he was disinherited. He gave up his original idea of taking holy orders, and began practising as a scrivener. He made a tour over the greater part of Europe, and at Paris he met the celebrated Grotius. He returned to England at the time the unhappy quarrels between Charles and his Parliament were in their height. His principles were republican, and he published many powerful works in support of his opinions. Milton was appointed Latin Secretary to Cromwell, when that ambitious soldier had assumed the protectorship. After the Restoration he was obliged to make himself scarce for awhile, and he for a long time lay concealed in the house of one of his former friends, but he was at last enabled to live in security through the influence of his friend Sir William D., to whom he had before rendered a like service. He married twice, and put away his first wife without a divorce, and defended himself in a work he published.

He got blind from overstudy, and is said to have dictated his celebrated works the 'Paradise Lost and Regained' to his daughters.

"Libra," one of the twelve signs of the Zodiac.

"The fleecy star," the star representing the golden fleece of the Argonauts, above which is placed the figure of Andromeda, as she is represented in Mythology to have been borne by it when pursued by the jealous Juno.

IV.—*Book the 4th.*

> "About them frisking played
> All beasts of the earth, since wild, and of all chase
> In wood or wilderness, forest or den;
> Sporting the lion *ramped* and in his paw
> Dandled, the kid, bears, tigers, ounces, pards,
> Gombol'd before them: the unwieldy elephant
> To make them mirth, used all his might and wreath'd
> His *lithe* proboscis: close the serpent sly
> Insinuating, wove with *Gordian* twine
> His braided train, and of his *fatal* guile
> Gave proof unheeded:"

Q.—What is "ramped?" the verbal and substantive forms of this word are not used now, but what common adjective is there formed from it?

His "*lithe* proboscis." What does "lithe" mean? and what is the usual word for an elephant's proboscis?"

Why "*Gordian* twine?" "and why *fatal* guile?"

A.—"Ramped," stood on his hind legs. A term in heraldry; lions rampant are very common in coats of arms. The shield, in the royal arms of England, is supported by a lion and unicorn, rampant, there being also a small rampant lion with a crown on his head, placed above it.

From "Ramped" comes "Rampant."

"Lithe," limber, easily moved about. We usually say an elephant's "*trunk.*"

Gordius was a king of Lydia in Asia Minor. He tied the pole of his cart with such an intricate knot, that it has passed into a proverb. The tradition was that whoever could open it would become conqueror of all Asia. When Alexander invaded Persia he determined to realize the prophecy in his own person, but being unable to open the knot, he cut it through with his sword. "Twine" means twists, intricacies. When Satan tempted Eve to eat of the forbidden fruit he assumed the form of a serpent, as we read in Genesis, the woman says "the *serpent* tempted me and I did eat."

QUESTIONS IN POLITICAL ECONOMY, PROPOSED TO THE SENIOR CLASS, AGRA COLLEGE, AND ANSWERS BY R. FORREST.

QUESTION 1st.—In what respect may money be regarded as wealth? What are the duties of the rich as such?

ANSWER.—All the things necessary, useful, and agreeable to man, which possess value in exchange, constitute wealth. Formerly indeed, the precious metals, gold and silver, were supposed alone to constitute wealth, and hence arose the many statutes forbidding the exportation of bullion, &c. But this view of the matter has been long since proved to be fallacious, and now we regard money as wealth merely because it is possessed of great exchangeable value, being a commodity which all classes of people are ready to take in exchange for the peculiar products of their industry. It may be very useful, as a general standard and medium, yet it is the exchangeable quality of wealth, which alone entitles it to be considered as wealth.

Riches are able to effect almost any thing, and it's impossible to calculate the amount of good a rich man may effect who uses his wealth for the benefit of his fellow men. The rich were formerly curtailed in their expences by sumptuary laws, &c., which were enacted for the purpose of restraining luxurious habits. Yet these have been long since repealed, for a man should be generally allowed to do what he likes with his own, and it has been proved that the rich, by living sumptuously, are in fact encouraging the arts and manufactures, for by this means many new articles are brought into requisition for their indulgence. The rich could not make better use of their wealth than in encouraging learning and the fine arts, and indeed the English nobility and rich commoners have often shewn instances of almost princely generosity towards learned men. The Earl of Southampton, in Elizabeth's reign, made Shakespeare a present of £1000, a large sum in those days, and there are other instances too numerous to be mentioned here. For the above purpose, the establishment of Schools and Colleges is also one of the best ways in which the rich could employ their wealth. As the chief inconveniences suffered by people in this country are principally from the heat of the sun, and consequent thirst, the rich in India gain themselves a name by the erection of *surais*,* and the sinking of wells.

* or Caravanserais.

Q. 2nd.—Point out the relation between wealth and labor, and show what part the latter bears in the regulation of price?

A.—Labor was the purchase money paid for all things; wealth proceeds neither from good soils nor from silver and gold, it is labor,

and labor alone which constitutes wealth. Mr. Locke shows us how the Mexican and other American nations, though possessed of a fruitful soil and salubrious climate, are yet in a state of poverty, and a laborer in England is possessed of an hundred more comforts than a laborer there. The earth does indeed pour forth her riches in abundance, yet as it is given us for nothing, it is the labor alone which appropriates her products and adapts them to our use that gives them their value. Any one who observes the iron ore as it comes out of the mine, and then beholds it in the shape of the various elegant articles it is afterwards manufactured into, will understand what labor has done for it. It is labor alone which makes any thing "*valuable*," and nothing can be said to constitute wealth, in the production of which labor has not been employed. The least thing we possess must be produced by the intervention of labor: what changes does a loaf of bread undergo, from its first appearance as a ear of corn, until it issues from the baker's oven in the shape of a hot roll. The numbers employed in making the plough, and the ship which brought the iron, of which it is made from other countries, are too numerous to be mentioned. The price of an article is proportioned to the time and labor employed in making it. Yet the labor required in making an article is not always the best criterion of its price, for that also depends in a great measure on the skill requisite for manufacturing the article, and whether the workman has to undergo any previous training.

Q. 3rd.—How may learning be viewed as a producer of wealth?

A.—Learning is indeed the "producer of wealth." Where the workmen are well educated, it is found that they can perform their work with greater skill, for knowledge tends to expand the mind, and they are thus enabled to understand the principles which regulate the operations of the business they are engaged in. But the manner in which learning is generally called the producer of wealth is, by the numerous discoveries, which facilitate labor and production made by learned men. It was the knowledge Sir Humphrey Davey had of the chemical properties of air, &c., which enabled him to construct his famous Safety Lamp. The knowledge Watt had of Mechanics enabled him to bring the steam engine to its present high state of perfection, and by its means to increase the internal commerce of England to an incalculable extent. The inventions of Hengram, Raikes and Arkwright have caused the manufactures of cotton to become one of the chief branches of trade in England, and it is declared that the rapid advances we made in that department of industry alone bore us triumphantly through the revolutionary war in France.

Q. 4th.—Does "caste," as it exists among the Hindoos, operate favorably or otherwise upon the cultivation and exercise of the useful arts?

A.—The distinction of caste among the Hindoos is one of the chief causes of their not proceeding onwards in the path of civilization, and improving in manufacturing skill. They are not allowed to engage in what trade they like, and in which being suited to their disposition they would most likely prosper. Whether suited to their disposition or not, they must *perforce* engage in the trade their father carried on before them. Each trade indeed constitutes a *caste*. The weavers of cloth are called *coolys*, which is also their caste, and so on. They cannot engage in another trade for they would lose their caste, and thus it is that invention is fettered, and the Hindoo pursues the beaten path his predecessors trod in, without ever entertaining a thought of bettering his condition by engaging in some trade more congenial to himself or better suited to the times.

Q. 5th.—Give a sketch of the progress of a piece of iron from its discovery in the mine till its appearance as the blade of a penknife?

A.—From the mine the iron ore is taken to the foundry. It must first be cleansed of all extraneous matter such as sand, &c. The melting is performed in large earthen vats, and as the best part of the melted ore flows underneath, the scum rising to the top, it is drawn out of these vats by holes placed near the bottom. It is then formed into large bars, which have now to be made into steel, for the *iron* is too soft for manufacturing purposes. The bars are accordingly again heated and smothered in pulverized charcoal. They now undergo the decisive change, and are formed into the different kinds of steel we see as the blue elastic steel for watch springs, or the beautifully tempered metal employed in making the blade of a penknife.

Q. 6th.—Who was Arkwright? When did he live, and for what invention is he famous?

A.—Richard, afterwards Sir Richard Arkwright, was a hair-dresser. But possessing a genius for Mechanics he applied himself to the construction of an improved machine for spinning cotton. He underwent many hardships and misfortunes in prosecuting his schemes, for though he had invented the famous machine for spinning cotton, called the Spinning Jenny, he was annoyed by the persecution of those who had an interest in preventing his machine from succeeding, and as a poor barber, he could hardly get any one to join with him. He however overcame all these difficulties, and was presented to his Majesty George III. who conferred the dignity of knighthood on him.

Q. 7th.—Who was Adam Smith? When did he live, and for what is he celebrated?

A.—Adam Smith, who lived about the middle of the last century, may indeed be called the founder of the modern system of Political Economy. It is true that he adopted many of the truths which had been before treated of by other writers, but he it was who discovered the principles on which they proceed, and pointed out their practical applications. Many writers had before pointed out the great effects produced by the "labor of men," but they had none of them sufficiently demonstrated its principles and effects, and it was reserved for Dr. Smith to point out the great truth, "that all wealth flows from the labor of man." He has in his "Wealth of Nations" shown how incalculably production is increased by the division of labor, and though there are many objectionable passages in this celebrated work of his, yet it must ever be regarded as one of the few books which have proved of essential benefit to mankind.

Q. 8th.—It is said that "the Jack of all trades is master of none." If such be the case how does it happen?

A.—The old proverb of the "Jack of all trades being master of none" is as true as it is trite. No man can hope to attain perfection in all the branches of learning or workmanship. One of the chiefest benefits arising from the division of labor is "increased skill and dexterity in the workmen," and this remark is applicable to the labours of the head as well as of the hands. When a man directs all his energies, whether of mind or body, to one particular object, it is much more likely that he will attain to perfection in it, than if he was engaged in two or three others beside. If mere superficial accomplishments be his object, a man may put his mind to as many different kinds of study as he chooses, but to be master of any one he must attend to it alone. Dr. Smith says, that a mere lad who is brought up to the trade of nail-making can, when he exerts himself, make as many as 3000 nails in a day, while a smith who can make nails, but who does not attend solely to it, can hardly make more than 1000; as there is in every branch of industry a peculiar knack or slight of hand, which can only be obtained by constant practice, and the turn of hand required in one is generally different from that required in another. It is for this reason that in England each part of a watch is made by a different workman: one making one kind of wheel, another, another kind, and so on. Leibnitz was perhaps the most universal genius that ever lived, yet it is on account of this too great universality that he has not executed some one great work, which would have handed his name down to posterity.

Q. 9th.—Define "exchange." How does it happen that a Hoondee for Rs. 100 payable in Calcutta may often be purchased in these parts for Rs. 98?

A.—When a man produces any thing which is not for his own consumption, or of which he has a surplus, he exchanges it for some-

thing he requires, and of which some one also has a surplus, so that they both mutually assist one another. The shoemaker gives the farmer a pair of shoes, which he is in want of, and receives from him a certain quantity of wheat. This is the origin of exchange and barter, which are now chiefly carried on through the intervention of money.

Bills of Exchange are written orders of money sent from one country to another, to avoid the risk and expense incurred in sending specie. Thus if A in London owes B in Calcutta Rs. 500, while C of Calcutta owes D of London the same sum, the manner of proceeding is this. Instead of paying his debt in specie, C, who then a creditor in London, goes to B, who has a debtor there, and paying him Rs. 500 receives an order from him on A of London for Rs. 500, C now makes this draft payable to his creditor D in London, who gets the money from A. On this principle suppose I have a creditor in Calcutta to whom I owe Rs. 100, I find out the person who holds the hoondee in question, and as he escapes the risk and expense of getting his money from Calcutta, he lets me have it for Rs. 98, and I of course send it down to my creditor in Calcutta, who gets the money from the person or bank on whom it is drawn.

Q.—What is capital? How does it assist labour? Give an example from amongst things familiar to you.

A.—The capital of a country is that portion of its revenue which is set apart for the purpose of reproduction, after the costs of production, &c., have been deducted.

Dr. Smith mentions three things which chiefly facilitate production, (1) security of property, (2) exchange, and consequent to that the appropriation of persons to particular employments, and (3) accumulation of capital. For without capital we would be unable to make that extensive division of employment among work-people, which so much assists production. Besides what are all our machines but hoarded capital, but we are so accustomed to enjoy their productions that we can hardly imagine what we would be without them? Indeed all tools are to be considered as capital, and what could we do without them? What a quantity of hoarded capital does a carpenter's shop contain, and with how much more ease can he execute his work by having a set of tools suited for each operation than if he had to do all his work with one set alone, and each tool is so much hoarded capital. Mr. McCulloch says, that one of the greatest savings effected by capital is where, in large manufactures, there are different kinds of work requiring different abilities, we are enabled to suit them accordingly, giving the lighter work to women and children, who are of course less paid, and not to men who would have to be paid full price for doing little work. But the bows and arrows, the net or the canoe of the savage, are as much capital as the loom of the weaver or the spinning jenny, so that man cannot execute the slightest labour without making use of capital.

QUESTIONS IN ELPHINSTONE'S HISTORY OF INDIA, PROPOSED TO THE SENIOR CLASS, DEHLIE COLLEGE, AND ANSWERS BY JUDHOO NATH.

QUESTION 1st.—What inference do you draw from the former servile and degraded condition of the Sudras, what considerations are in favor of the idea of the foreign origin of the twice-born classes, and what are opposed to it, what two peculiarities in relation to the brahmins are specially observable in the Code of Menu ?

ANSWER.—From the servile and degraded condition of the Sudras, it may be inferred that the three twice-born classes were the conquerors at that early age that subdued the Sudras, whether the conquerors of different classes or sets of the same class, who, possessing knowledge, overcame their neighbours in the course of time. The laws were therefore very jealously and unjustly dictated against the Sudras, and favorably towards the victors and their followers. As almost all the barbarous and uncivilized nations were accompanied by soothsayers or priests, so were the Kshetriyas or the Military body of this country, accompanied by the brahmins, who thereby possessed great influence over them, and moreover, being master of all knowledge, they got the power of enacting or framing the laws for the regulation of the country, in which they of course, cunningly exalted their own caste above the rest, by securing the executive power and riches of the country to the military and their other followers (Veisyas) other favorable employments, such as agriculture and commerce, &c., and reduced the conquered to the degraded and servile condition little better than that of the slaves, because they were permitted to serve whomsoever of the three twice-born classes they pleased, but it was far better if the master was a brahmin. They were allowed the right of property and to go into any other country he please.

Some suppose that the three twice-born classes were of foreign origin, by alleging that features of the twice-born classes respectively resemble one another, that is, the feature of a brahmin resembles that of one of his own caste, and unlike that of any of the different class, but this assertion is not valid, because the most unlike in features are the Chandalas, descended from a brahmin mother. Another reason they give that the Sanskrit language somewhat resembles the western languages, which may faintly prove their foreign origin, but of this no proper proof could be discovered, because no Hindoo work has any trace of foreign origin, even their mythology does not extend beyond the Himalaya ; some again say that the rajpoots are of foreign origin by asserting, (1) that their four tribes have some tradition of their origin from another country, but it is not satisfactory, because the story of their origin extend no farther than mount Abu ; (2) that some of the rajpoots did actually come over across the Indus,

namely, that of the Lama tribe, true, they did come, but they were driven across the Indus after the death of Krishna, their ancestor of the purest Hindoo descent; (3rd and 4th) that some of the rajpoot names, manners and customs, &c. resemble those of the Scythians, but this is not true, for they almost entirely resemble the Hindoo ones, and moreover, they are not expounded in Scythian language. There are two other reasons of the settlements of the Huns (like the Mussulmans, &c.) which do not at all prove the foreign origin of them, and the (7th) reason concerning the settlement of the Geld, may perhaps prove the foreign origin of the jats.

The two peculiarities relating to the brahmins are, (1) that they attached little importance to the public worship, and (2) concerning the regulation of the actions, &c. of life, which every family of that class, exactly coincided in almost every particular with others, though separated by a great distance, inhabiting so vast a region and without any chief or head whatever.

Q. 2nd.—Mention the changes that have taken place since Menu in the division and employment of the classes, and explain the civil effect of the loss of caste?

A.—At the time of Menu, there were four classes, the Brahmins, the Kshetriyas, the Vesyas, and the Sudras, (1st), a Brahmin was directed to spend the first part of his life as student, in 2nd part, an ordinary family man, in the 3rd, as an anchorite, and, in the 4th, he should contemplate; he may receive gifts from other classes or beg, &c, or trade on great necessity, but never to enter into any service. He should avoid all worldly pleasures and wealth, as he would avoid poison, and should constantly read the Vedas, and assist others to sacrifice and other injunctions. A Kshetriya was directed to protect the country, to read the Vedas, and to avoid sensual pleasures, &c. &c. A Vesya to cultivate the lands, and to trade, &c., and the servile and the degraded Sudra to serve those three classes, especially the Brahmin, almost like a slave.

But the Brahmins now allege, that the three other classes, but their own are extinguished, which is not satisfactory, for many now claim to be descended from them, as the rajpoots from the second class, Mahrattas from the Sudras, &c. At the time of Menu, the brahmins took their wives from the three inferior classes as well as from their own, and so every one of the other classes could from the classes below him, but could not from a superior; but now one class is strictly prohibited to intermarry with any other class but his own. At the time of Menu, they (brahmins) ate meat, now they do not, though few excepted. They at his time did not enter into any service, but now they become soldiers, husbandmen, writers in offices, and merchants, &c. They do not now observe the fourfold duties

of a brahmin's life, except some few ones, and give themselves up to every kind of worldly pleasures. Monastic orders are now introduced, of the members of different classes, among whom there is no distinction of castes. The Sudras are no longer considered as slaves, but are free. The civil effect of the loss of caste is that a man is deprived of all his inheritance, expelled from his family, his relations or others are strictly prohibited to hold any intercourse with him, to eat with him or to sit with, &c., he cannot have the comfort of wife or children, father, brother, or mother, &c.

Now, moreover, there are hundreds of castes, according to the professions which they follow respectively, all these of course hinder improvements in this country.

Q. 3rd.—Explain the right of property in land, and the nature of the King's right in connection with the soil, explain also the probable origin and the causes of the decline of the village communities.

A.—It has been greatly agitated in whom the right of property properly belongs, some say in the State, some in the landholders, some in the tenants, or some in zeminders. Now the right of property in land only could belong to him who has the power to destroy its power of producing, and to have it as it is, or transfer it to his descendants, &c. Now these the King cannot do, where the village laidholders remain or the permanent tenants, because as long as they pay his due, he cannot legally interfere with their lands or themselves. Again, the village landholders cannot interfere with the lands of any of his permanent tenants as long as he continues to pay his due, and that of the Government. And again the permanent tenants cannot destroy the property of the land, for they are responsible for it to their landholders. But where there are no village landholders, and the permanent tenants, &c., the King is of course the master of the property of the land, and can do with it whatever he pleases. Therefore, where there are village landholders or communities and permanent tenants, the right of property exist with neither parties, but where there are none of those two, the King is, of course, the master of it.

The origin and decline of the village communities may be traced in the following manner. When the Hindoos settled in this country and great deal of land which was distributed among themselves, each had a large piece of land, therein to settle the village, but could scarcely clear or protect it against the encroachment of the wild beasts, or the aborigines of the country, and therefore he invited others to his help, but no one would come to his aid, unless he would have it to enjoy it for ever, and to transfer to his descendants because there was so plenty of land in other parts; and in this way the village communities rose. Now as the lands were hereditary, and each person left it to his descendants who divided it among themselves, and

in the course of time his numerous descendants came to possess a little patch of ground for each respectively. Now in such a state, they could do no service to themselves or the State, and when the Mussulmans conquered this country, seeing the shattered condition of them, they took away their lands and committed them to those under their trust. Thus was the decline of the village communities. Other causes of their decline are the farming of the revenue, oppressive exactions of the Government, and partly the foreign conquest.

Q. 4th.—Mention the principal changes which have been introduced in religion since Menu. Name the chief divinities who are objects of Hindoo worship, and state the Hindoo belief respecting a future state?

A.—The principal changes in religion since Menu are the following:

The neglect of Monotheism ; introduction of new gods, and the neglect of others of that time, as the Indra, &c., or of the elements ; image worship; worship of the deified mortals; particular faith in some particular object is efficacious, and to rely on external observances for salvation. Neglect of the worship of the Vedas, and the introduction of a new ritual of the Purans, &c.

The principal Hindoo gods are, Brahma, the creating principle ; Vishnu, the preserving principle; Sewa, the destroying principle; Shereswati, consort of the former; Lukshmi of Vishnoo and Parwuttee or Devi, &c.; Indra, god of the Heavens, Puona, of the wind, Kuvera, of wealth, Cama, of love, Agni, of fire, Gunnesh, the remover of difficulties, Surya, the sun, Soma, the Moon, Vurana, of the waters, but Krishna and Rama are the principal objects of the Hindoo worship. The belief of the Hindoos respecting a future state is transmigration of the souls, and all will go to heaven or to hell according to his deeds of this world, but at length the most wicked will go into heaven and be absorbed in the Divine essence, after the purging of their sins in thousands of repeated transmigrations.

Q. 5th.—Compare the religion of the Boodhas and the Jains with that of the Hindoos, indicating the main points of resemblance and of difference, and mentioning the countries where they repectively prevail ?

A.—The Boodha and the Jain resemble the Hindoo religion in a future state, in their quietism or obtaining a perfect state of apathy in transmigrations, and the rewards of a man in one of the different kinds of hells or heavens. Hindoos worship idols, they worship a limitted number of the saints, in their preserving the lives of the insects and animals. They differ from the Hindoos in denying the au-

thority of Vedas on account of the sacrifices; the Boodhas almost entirely deny other Hindoo gods; some of them deny the existence of God; they repudiated the doctrine of castes, every man can be a priest, bound with strict order of celibacy. The Jains almost never bathe. The Jains are very few, and their religion prevails in some part of Guzerate and in the south of the Peninsula (Deccan). The Boodha religion prevails in Nepaul, Ceylon Burmah, Siam, China, Thibet, Japan, and the Chinese Tartary.

Q. 6th.—Give an account of the principal schools of philosophy (naming the founders) and of their distinguishing tenets?

A.—There were six principal schools of philosophy among the Hindoos; (1) Prior Mimansa, founded by Jamani, this school taught the method of reasoning how to help in expounding the doctrine of the Vedas, to prescribe the devotional methods of worship, and therefore purely religious. 2nd. Latter Mimansa, founded by Vyas as is supposed, this very much resembled the former, or was almost the same. (3) Nyaya or logical school, founded by Gautama, which taught the method of reasoning, and agrees in many points with the Grecian schools, especially with that of Aristotle, in classification, predicaments and syllogism, &c., and has left many cobwebs of learning. (4) Atomic school of Canade, the founder. This stated that the world and every thing are composed of (matter or) atoms, which possess inherent powers of renewing when fallen, thus the world destroyed became again world; and moreover, the atoms are eternal. (5) Theistical school of Patanjali, the founder, who supposes every thing to be derived from the essence of God, and he is the sole existence and denied the eternity of matter. (6) Atheistical school of Capila, who denied the existence of God, and asserted matter to be eternal.

Q. 7th.—Looking into the ancient Hindoo character and state of civilization, as exhibited in the code of Menu, and other extant works, remark the changes for the worse, and indicate the causes of the deterioration.

A.—The character and state of Hindoo civilization since Menu's time to the present have been undoubtedly for the worse, as may appear in the following accounts. At the time of Menu the laws of war were mild and humane towards the enemies, when defeated, as giving them immediate quarters, to fight with exact equality, foot with foot, horse with horse, &c., and to preserve the laws and customs of the conquered country, and even to reinstate the fallen monarch, &c., and to forgive every one that offers submission and to him who flies, &c. But the wars of the late ages were, and are carried on with ferocity and rudeness, though less rude than any other nations of Asia. Their mode of carrying on wars worse than that of Menu's time, except their good choice of ground and cannonade, &c.

The laws towards women are now far more unfavorable and more strict than those of the time of the Code.

The introduction of suttees, that is, burning the widows on the funeral pile with their husbands, cannot be traced in the time of that lawgiver, though some say faintly, that it is noticed in the Rig-Veda. But the emancipation of the servile class, that is, the Sudras, is undoubtedly an improvement.

The great increase of sects and castes and the prohibition of intermarriages between classes, that is, every one is now prohibited to marry a woman of a different caste, are for the worse, and which hinder improvements in a country. The religion was far more pure at that time than the present worship of the idols, &c.

The character of the Hindoos of that time was far better than the present; the Hindoos of that time were honest, true to their words, manly and courageous, &c.; but now they are taking bribes, telling lies, and want a great deal of courage, &c.

The causes of these are, that the present religion encourages inaction, the strict distinction of castes, the prohibition of intermarriage, early marriage, prohibition to go beyond the limits of India, and above all, the introduction of the despotic and tyrannical Governments, which took half the produce of the lands, &c., whereas the land-tax was about one-sixth of the produce of the land, &c.

Q. 8th.—What was the probable date of Menu's Code, and how is it ascertained?

A.—The probable date of the Code of Menu was about the 9th century before Christ. It is ascertained by fixing at first the date of the compilation of the Vedas by Veyas. 1st, By the measure of time, employed by the Hindoos in an Astronomical treatise, appended to the Vedas for regulating the exact time of the ceremonial observances of that time, for it was a cycle of five years of lunar months, which after various corrections and intercalations, &c. have been now received by the Hindoos; which proves that the Vedas were compiled in the 14th century before Christ. 2nd. By the decisive proof of noting the position of the solstitial points, which were situated in the 14th century before Christ. These points are laid down in the Astronomical part of the Vedas. 3rd. In the Essay of Mr. Colebrooke the correspondence of the seasons with the months with regard to cardinal points of that time, fixes the compilation of the Vedas in the 14th century before Christ. But Menu refers almost in every page for the authority in his Code to the Vedas, which proves that the Code was written after the compilation of those books, and we find the rules of war and other customs, &c. laid down in Menu,

given by the historians of Alexander, at 4th century B. C., therefore the Code was written between 14th and 4th centuries, and by various accounts, &c., it is fixed at 9th century B. C.

Q. 9th.—What progress was made by the Arabs in the conquest of India, narrate in detail the operations of Casim, and state how the Mussulmans were subsequently expelled, and in what year ?

A.—The Arabs at their early period made no impression on the soil of India, though they made frequent inroads in the Punjab, Sind and other places on the Indus, &c., carrying many prisoners and taking possession of some provinces, as the conquests of Casim, which extend from Calabagh on the north and Mooltan on the south, but they for a short time enjoyed its fruits, without making any permanent impression on its soil.

A vessel of the Arabs was taken and plundered by the Hindoos at port of Dewal in Sind, the Arabs under their Caliph Wullid, called on Raja Dahir, whose dominions extended from Calabagh to Mooltan, and whose capital was Alvi, for its restitution. The Raja refused on the plea that Dewal was not under his authority. The Arabs enraged at his refusal, sent some number of troops to enforce their demand, but which was destroyed on the way. At length the Governor of Busra sent his Nephew Mahomed Casim with an army of 6000 men, which was assembled at Shiraz. Casim reached Dewal and succeeded in reducing it, by breaking down the flag of the temple, (which commanded the town) which act broke the spirit of the soldiers. Casim carried it by storm, and put to death every individual above 17 years of age, on their refusal of being circumcised, and reduced the rest to bondage. Thence he advanced to Bramanabad, where a son of Dahir had retreated on the reduction of Dewal, he took it, and after taking possession of Nerum, now Hydrabad, he laid siege to Saman, which submitted in a few days. He now advanced near Alvi itself, where he was opposed by Raja Dahir himself at the head of an army of 50,000 men, but in the midst of action a fire-ball struck the elephant on which Dahir was, the animal fled and plunged in the neighbouring river, but the Raja escaped, and though wounded by an arrow, mounted a horse, and began to fight with great fury, but after all he could not restore the fortune of the day. Casim became victorious, but could not immediately take Alvi, for the Ranee of Dahir defended it with great vigor for some time, and at seeing no relief, the Rajpoots sacrificed their wives and children in the flames, opened the gates, and boldly perished to a man on the swords of the enemies. After this Casim took Aschundra and Mooltan, after a small resistance. The death of Casim by the artifice of Dahir's put these conquered provinces under the hands of Teimeen, till the downfall of the Omeiya dynasty, and the high spirit of the Rajpoot expelled the Mahomedans in 750 A. D. from India.

Q. 10th.—Under what circumstances was the kingdom of Ghuznee founded by Altegin, and what were the incidents of the war between his successor and the Raja of Lahore ?

A.—At the death of Abdulmullick, the fourth monarch of the Samanis on the throne of Bokharah, &c. left a young lad of the name of Mansur as his heir; but a division arose at the succession, for some were desirous of raising the uncle of the late king on the throne, and Alptegin, formerly a slave of Abdulmullick, but now the governor of Khorassan, happened to give his suffrage in favor of the uncle, which greatly displeased Mansur, and when he became king by the union of the parties, Alptegin would have been imprisoned and put to death, had he not escaped by the discipline and aid of his Mamluke guards, to Ghuznee, in the heart of the Suliman mountains, where he expelled all the subsequent attacks of the Samanis ; and after a reign of 14 years he died in 975 A. D. He or his son Isakh was succeeded by Subuktugeen, formerly a slave of Alptegin in 976 A. D. Jeipal, the Raja of Lahore, being alarmed by the establishment of a Mahomedan dynasty so near his dominions, invaded the dominions of Subuktugeen, who encountered him at Langman, where the Hindoos were defeated, and Jeipal was obliged to give the victor 50 of his elephants and promised to pay a large ransom in money to his messengers ; but on his return to Lahore he refused to fulfil his engagements, and imprisoned the officers sent to receive the money. On this intelligence, Subuktugeen assembled his troops and opposed Jeipal again at Langman, who had succeeded in obtaining the aid of the kings of Delhi, Kunouj, Calinger, Ojein and of others, &c. But at length the Hindoos were again defeated, and the Mussulmans became victorious, and Subuktugeen plundered some parts of the Punjab, carried away many prisoners, and took possession of Peshawur and the provinces bordering on the Indus.

Q. 11th.—Give an account of Mahmood's successive expeditions in India, and their respective results ?

A.—Mahmood, the son of Subuktugeen, ascended the throne of Ghuznee in the year 997 A. D., various motives of plunder and glory led him to turn his arms against the Hindoos. In the year 1001 A. D., he left Ghuznee with an army, and attacked Jeipal at Peshawur, where he defeated the Hindoos and overran the Punjab as far as Sutlej, and obliged the Raja to an annual tribute. At this event, Jeipal terminated his life on the funeral pile, and was succeeded by Aungpal.

His second expedition was against the chief of Bhutia, who had refused to pay the share of his tribute.

His 3rd expedition was against Futteh Khan Lody of Mooltan for his revolt,

His 4th expedition was in 1008 A. D. against Aungpal, who had interfered between the chief of Mooltan and Mahmood, and moreover, who had excited him to rebellion. He defeated the Raja with great difficulty, for he had obtained the aid of the kings of Delhie, Kunouj, Calinger, Guzerat, Ajmere, &c.; after the submission of the Raja, he took and plundered Nugurkote.

His 5th expedition was again against Mooltan, when he brought Futteh Khan Lody prisoner.

His 6th expedition was against Thaneshur, a sacred place of the Hindoos, took it and plundered it of all its immense riches.

His 7th and 8th expeditions were against Cashmere, on which he made no great impression, but suffered some hardships.

His 9th expedition was in 1017 A. D. He left his capital, and by keeping himself on the mountainous route, where the rivers were very easy to cross, he appeared before Kunouj, the admiration of the Mahomedans, which he spared on the unqualified submission of the Raja. He thence moved to Muttra, the birth place of Krishna, which he plundered and massacred its inhabitants. He next moved to Mahawur and Munj, which he successively took and plundered ; and then returned to his capital laden with immense plunder. On this occasion, he annexed the Punjab to his dominions on the opposition of Jeipal II., son of Aungpal.

His 10th and 11th expeditions were against the Raja of Calinger, but there he made no impression.

His 12th expedition was against the celebrated temple of Somnath in 1024 A. D. On his way thither he took and plundered Ajmere, then crossed the desert and unexpectedly took possession of Anhalwarra, the capital of Guzerat, the Raja of which saved himself by flight. He thence moved to the temple of Somnath, which he took after obstinate resistance by its garrison and the neighbouring princes who came to its relief. He destroyed the idol Somnath and robbed it of all its riches ; then he took Gundalia; and after residing there a long time, returned to Ghuznee after suffering great hardships. Afterwards he subdued the Jats of Mooltan.

Q. 12th.—Name in order, and with date of each of the Ghuznuvite kings, who succeeded Mahmood, and in like manner give a list of the kings of the house of Ghoree?

A.—*Names of the Kings of Ghuznee.*	*Date of succession.*
Mahomed (deposed by Musaud,)	1030 A. D.
Musaud,	1030 A. D.

Names of the Kings of Ghoree.	*Date of succession.*
Ahmud,	1049 A. D.
Mahdood,	1050 A. D.
4 Kings after Musaud for 4 years.	
Sultan Ibrahim,	1057 A. D.
Musaud II.	1097 A. D.
Arslam,	for some time.
Behram,	1116 A. D.
Khusro,	1151 A. D.
Khusro Mullik,	1158 A. D.
The Ghuzni dynasty ended in	1186 A. D.
Kutub-u-deen Mahomed was killed by Behram Sief-u-deen his brother.	
Alla-u-deen, ditto ditto	1151 A. D.
Sief-u-deen for one year, about	1184 A. D.
Ghias-u-deen, ditto	1184 A. D.
Shahab-u-deen or Mahomed Ghory, about	1198 A. D.
Mahmood his successor, about	1203 A. D.

With Mahmood ended the Ghorian dynasty, he reigned about 4 or 5 years.

Questions in Warren's Selections from Blackstone, proposed to the Senior Class, Delhie College, and Answers by Bishen Nath.

Question 1st.—Explain what is meant by law in general, by the law of nature, by revealed law, by the law of nations, and by the municipal law?

Answers.—The term law, when taken in its general sense, simply signifies a rule of action, indiscriminately applied to all things, whether animate or inanimate, rational or irrational. Thus for instance we say the laws of Nature, the laws of Optics, and the laws of Gravitation.

When the Almighty God created matter out of Chaos, he endowed it with certain unchangeable laws, from which it can never depart; or to speak more particularly, when an artisan or a mechanic makes a piece of work, for example a clock, he lays down certain laws by which it must be bound for ever, and as long as that clock is bound by that law, it is considered right, but if not, the result is also contrary.

The whole animal and vegetable kingdoms are governed by the general laws, from the very seed of the plant to its root. Since it is evident that law is a general rule of action, or a rule of human conduct, which is directed by a superior, and which the inferior is bound to obey, and that a state of dependency, always supposes some superior

which the inferior must obey, hence arises the necessity of the law of nature. For man as a creature must follow the will of his Maker, or Creator, and this will is called the law of nature.

Now, as God is a Being of infinite power, he would make such laws as he would think proper, whether good or bad, just or unjust, but as he is also a Being of infinite goodness, he made such laws, as a man is bound to follow, to seek his own true and substantial happiness, and thus God has reduced all laws to one precept, which is, that a man should always seek his own good, or self-love. Now from the laws of nature, we proceed to the revealed law.

Since it is certain that man's reason in its present imperfect state, would not be able to understand these laws, without following the metaphysical chain of reasoning, hence also arises the necessity of Divine interposition, which is to reveal his will to his creatures; were our reason as perfect as it was in the days of our first ancestor, there would not have been any need of such Divine aid; but as it is not the case in this age so we should seek assistance from the laws which are revealed in the Scriptures. These are called revealed laws, because they are revealed by God himself.

If a man were to live in a separated state from society, there would be no need of any other law, except the law of nature; but as men cannot live in an unconnected state, there arises the necessity of another law, which is called the law of nations. And as it is impossible for mankind to live in one great society together, they should consequently divide themselves into different states or communities, and hence it is that these laws which regulate the intercourse and communication between these states, are called the laws of nations. They depend upon the mutual compacts and treaties of these communities. Municipal law is a rule of conduct, prescribed by a superior, and which the inferior is bound to obey, commanding what is right, and prohibiting what is wrong. It is called a rule, because it is not a temporary or a transient rule, it is also called rule to distinguish it from compact, advice and agreement, which depend upon our approbation. To mention all its particulars is not pertinent to our point of question.

Q. 2nd.—In what does personal liberty consist, and what does Magna Charta enact regarding it; and what the Habeas Corpus act?

A.—Personal liberty consists in having a freedom of locomotion, that is, removing a man's person wherever he pleases, or thinks proper, and in going to any place whatever, where his inclinations carry him, without any restraint or restrictions of the laws of the country, and the laws of the land; this is one of those absolute rights which the subjects of England enjoy to this day. As a consequence

of this liberty, no man can be imprisoned or detained without a proper cause being assigned for his commitment.

No man against his will can be forced to leave his country, nay, no power on the earth except the Parliament, can transport or banish a man from his mother country. So great is the regard for personal liberty, that a man who keeps his fellow subject in a private house or beats him or insults him in any other way, is considered guilty in the eye of the law.

Respecting this liberty Magna Charta enacts, that no free man shall be imprisoned or detained, without the judgment of his peers or equals, and without the authority of the law of the land.

The Habeas Corpus act which was drawn up in the reign of Charles the Second, enacts that a prisoner should be immediately supplied with a writ, containing the cause of his commitment. And that no man should pass beyond the seas, or should be transported to Jersey, Guernsey, and to Ireland, where he cannot enjoy the benefits of the common law.

The King even cannot create a man Lord Deputy of Ireland or of any other place against his will and consent, for, if he could force him to leave his country, this would amount to an honorable imprisonment.

Q. 3rd.—When was the union between England and Scotland effected ; state the principal articles of union ?

A.—The great object of James the First of England was to effect a union between these two kingdoms, but the national prejudices were too strong to effect such a desirable union.

At length it was in the reign of Queen Anne, about the year 1707, that the union between these two separate, but now one, and united kingdoms was effected.

The principal articles of the union are as follows:

1st. That the kingdoms of England and Scotland are united for ever since the year 1707 A. D., under the name of the kingdom of Great Britain.

2nd. That the right of succession to this kingdom shall be the same as with regard to England.

3rd. That all the subjects of Scotland shall be entitled to the same rights and privileges as the inhabitants of England are.

4th. That while England raises two million pounds, Scotland raises £ 48,000.

5th. That both kingdoms shall be represented by the same Parliament.

6th. There shall be 16 Peers for Scotland and 45 Commoners.

7th. That the Peers of Scotland shall be allowed to enjoy all the privileges which the Peers of England shall enjoy, but with some exceptions, such as the right of voting, and having a seat in the Parliament on the trial of a Peer.

8th. That all the laws relating to customs, excise, and commerce shall be the same as in England.

Q. 4th.—What are the constituent parts of the British Parliament, how is it summoned, what is the nature of its power, what is the right of the house of the Commons with regard to taxes, and on what is that right founded?

A.—The constituent parts of the British Parliament are the King's Majesty in his royal capacity, and the Lords Temporal and Spiritual, which together with the King sit in one house, and the Commons or the representative of the people, who sit in another house, which is generally called the lower house. The executive power is lodged in the hands of the King's Majesty; while the legislative is put in the hands of Parliament.

The manner in which a Parliament is summoned is as follows:

By the King's writ issued out from the Court of Chancery, with 40 days' notice, the Parliament is ordered to meet at a certain appointed place and time.

This system of calling a Parliament, is founded upon very good reason; for, if the members were to meet spontaneously, there would be no union between them, and hence there would be a great difficulty of judging, whether the present or absent members are the real members of the Parliament.

This method is highly becoming to the dignity and independency of the Parliament, where the King as its head generally appears in his royal robes.

The power and privileges of the Parliament are indefinite; it can repeal, make, abolish and abrogate the laws of the country.

Almost all the privileges are in the hands of this extraordinary tribunal ; in a word, it can do every thing which no power under the sun can undo, and consequently, it can make law of that which is not law. The great advantage and beauty of its powers being indefinite are, that the King cannot encroach upon its privileges.

The right of taxing the subjects is left to the house of Commons. Though the reason brought forward for having this right is that because they are the representatives of the people, therefore they tax them ; but the true and substantial reason is simply this, that the Lords are chosen by the King's pleasure, and they may be influenced by him, but the Commons, who have no such influence, have therefore this right of taxing and raising supplies in the kingdom. The Lords may prevent the Commons when they find them too lavish in their grants.

Q. 5th.—What are the theoritical advantages and impracticable disadvantages of an elective monarchy, and give some instances of the latter ?

A.—All regal governments are either hereditary or elective ; the advantages of an elective government are that if the minds of men were not disturbed by prejudices and passions, the best and most able men would only get the throne, which they deserved ; and the persons having no worthy qualifications would be excluded from it, but unfortunately at present all the elections are made by a spirit of partiality, and where such is not the case it is still suspected to be so.

This is an evil to which all societies, whether private or public, are subject in every country. In a private, or a small community, men may have recourse to their superiors, but in public communities or nations the recourse is generally made to arms ; and hence we see that elective monarchy has been the cause of bloodshed, as we see in the ancient History of Rome, and in modern ages in Germany and Poland.

Another instance of this nature may be seen in the murder of Charles the First by his subjects, when he was told by them that he was made King by election and not by his hereditary title.

Questions on Abercrombie's Intellectual Powers, proposed to the Senior Class, Benares College, and Answers by Ram Chundra Sein.

Question.—What is the distinction between the object or aim of *Science* and that of *Art*?

ANSWER.—The object of Science is to ascertain the established relation of objects, to trace the uniform relation of things. Its aim is to ascertain the tendency which certain events have of being uniformly followed by certain others. It refers effects to their true causes, and traces causes to their effects. The object of art on the other hand, is to avail ourselves of the knowledge thus acquired from Science, and to apply that knowledge in producing certain results, by bringing the bodies under such circumstances as are calculated to produce the required effects. In short, Science is the parent of art, or that art is but the offspring of Science. Art is founded upon Science, and he who knows an art without knowing the science upon which his art is built, is but an artizan or an empiric.

Q.—What are the three classes into which Abercrombie divides mental phenomena?

A.—The three classes into which Abercrombie divides mental phenomena are, Simple Intellect, Passive Emotions, and Active Emotions. Simple Intellect constitute those powers by which we perceive, remember, combine facts and trace their relations, that is, Perception, Memory, Imagination and Judgment. Passive Emotions are those powers by which the mind of an individual is affected by certain pleasurable or painful feelings. Active Emotions are such as influence the conduct of an individual.

Q.—In what way does he tell you that the Passive Emotions may be influenced or excited? Give examples.

A.—The Passive Emotions, says Dr. Abercrombie, may be influenced or excited in one of two ways, either through our relations to other sentient and intelligent beings, or, by relation to material or inanimate things. To the first of these, says he, belong some of the tenderest feelings, such as hope, joy, sorrow, &c., and to the second belong certain combinations of material things as are likely to excite certain feelings, such as our idea of the sublime, the beautiful, the terrible or the ludicrous. Several examples of these are to be met with in our daily affairs of life.

Q.—Into what classes does he divide the Active Emotions?

A.—Abercrombie divides the Active Emotions into two classes, or speaking properly, there are two branches of them. Active Emotions influence the conduct of men, either as moral or responsible beings, or as members of society; the former belongs to the Science of Morality, the latter to the Science of Politics.

Q.—On what principle may the Sciences be divided into the certain and the uncertain?

A.—Such sciences as are dependant upon axioms in which we can with facility and correctness ascertain the relations of facts, and trace causes to their true effects, and effects to their true causes, are considered as certain, and such sciences are suspected of uncertainty as are founded upon hasty conclusions and wrong inferences, without a sufficiently extensive observation of facts. (He who deals with such uncertain sciences is sure to be defeated in his attempts to produce a certain result, and to be involved in perplexity and error.)

Q.—Give some illustrations of the *uncertainty* of Sciences ?

A.—Illustrations of the uncertainty of sciences are to be met with, in all sciences as *have to* deal with the powers of living bodies, such as political philosophy, medicine, mental philosophy and others. The politician is " perplexed in the extreme" in political matters. It is after long observations and most cautious inductions that the facts of a statesman are collected. In such cases there are many temptations to grasp at premature inductions, and when such facts are once established, it is with great difficulty that their fallacy is exposed. Even after the mental philosopher has fully ascertained the established relation of facts, his attempts to produce a certain result may be, and is often defeated by, the intervention of some external circumstances which elude his observations, and which greatly and effectually influence the results he wishes to produce. In the same way, the philosophic doctor finds the difficulty of effecting his purposes when he observes, that he cures a sickness by the application of a certain remedy at one time, while at another he administers the same medicine in the same circumstances with little or no effect.

Q.—Give a definition of Mind?

A.—The mind, as defined by Dr. Abercrombie, is that part of our being which thinks and wills, reasons and remembers, and holds its intercourse with the external world by means of its corporeal agents.

Q.—Give a short account of the *Ideal* Theory and of *Materialism?*

A.—Philosophers have been of opinion that mind cannot act where it is not present, and upon this doctrine they maintained that mind does not perceive external things themselves, but only their form, idea, impression, species. Ideas they said are generated by vibrations in the medullary substance of the brain, by vibrations in the particles of the nerves, by the motion of the animal spirits which performed the office of messengers between the mind and its objects, the external things. Aristotle explained that ideas were formed by a combination of perception and reflection. Hooke thought that there were innate ideas, previous to any relation between mind and external objects. Plato compared the mind to

a subterranean cave. Locke compared it to a dark closet, and thus explained the ideal theory just as we would now explain how objects are reflected in a camera obscúra. Berkley, Des Cartes and Hume were of the same opinion. Thus was the ideal theory explained away by such eminent philosophers, without once thinking that they were meddling with matters quite beyond the limits of the greatest genius. (This sentiment of Des Cartes concerning ideas gave rise to a class called Egotists, who were his followers, and who believed nothing but self-existence). Opposite to this doctrine was the theory of materialism, the materialists say that mind is a mere chemical combination, that it is nothing but a function of the brain, and that it would consequently cease to be like the senses, and would dissipate to the winds on the dissolution of the body. But this theory is not only not sound, but it is opposite to the first truths. We cannot help doubting this tenet when we know that even in the material world

> "All changes, nought is lost; the forms are changed,
> "And that which has been, is not what it was,
> "Yet that which has been is."

Dr. Brown says, that the views of Berkley, regarding the non-existence of matter, is far more conceivable than that nothing but matter exists.

Q.—What do you understand by *sensation* and *perception; consciousness* and *reflection* and *testimony?*

A.—Dr. Brown defines sensation to be the simple impression made upon the organs of sense, and he says perception is the association of this impression with some external body. By the term "sensation" we should mean "feeling," taken in its ordinary sense. By perception we are to understand the knowledge acquired through the senses. Consciousness, says Abercrombie, is the act of attending to what is passing in the mind at the time; and reflection, says he, is a complex notion. Reflection properly signifies the remembrance of past facts, and their comparison with the present feelings, so as to observe a relation between them, and thus arrive at one of the first truths, namely, personal identity. Testimony is that part of our knowledge which we acquire, not from our own efforts, but from the perception of others.

Q.—What are the three heads to which Abercrombie refers the knowledge that we derive from *consciousness* and *reflection?*

A.—The three heads to which Abercrombie refers the knowledge that we derive from consciousness and reflection are, a knowledge of the mental processes, a knowledge of the compound notions, time, cause, motion, &c., and a knowledge of the "first principles of belief." It is by reflection and consciousness, says Dr. Abercrombie, that we are able to form a relation between the different phenomena of mind.

Q.—What does Abercrombie lay down as the principal "Intuitive articles of Belief?"

A.—Abercrombie lays down six principal "Intuitive articles of Belief." They are,

1st. A knowledge of the existence of man as a moral and responsible being; and a belief, of mind being different from the functions of the body.

2nd. A confidence in the evidence of our senses.

3rd. A belief in our mental operations, such as memory, &c.

4th. A confidence in our personal identity, that is, a belief that we are now the same being that we were some twenty years since.

5th. A belief that every effect must have a cause, and that every cause is adequate to the effect.

6th. A belief in the uniformity of nature, or, that the same causes will invariably produce the same effects under similar circumstances.

Questions in Brougham's Political Philosophy, proposed to the Senior Class, Benares College, and Answers by Ram Chundra Sein.

Question.—What are the objects of Political Science, and upon what order of facts are its doctrines founded?

Answer.—The objects of Political Science are grander and nobler, and much more interesting and pleasing to its readers than many other sciences. It aims at the increase of the happiness of the great mass of the community; of the whole people in general. Its object is to raise the standard of morality in the world. It teaches the people to secure to themselves the best mode of governing. It enables them to save themselves from a great many dangers by showing the evils which beset their predecessors under certain circumstances. A knowledge of Political Philosophy makes men fitted for the world for self-government. Its objects are indeed essential to the well being of all men. It is a knowledge of this science that has so much contributed to the happiness of the moderns; of men still living, who find themselves situated in a much better condition than the ancients. It is a science no less fertile and rich of pleasures than are to be found in Natural Philosophy and in the other Sciences. The facts upon

which its doctrines are founded are facts derived not from false theories and empty suppositions, but from real, plain, manifest and tangible circumstances; they are derived from the knowledge acquired from histories and from sound and solid inferences. The rise of one tribe over another, the moral and intellectual improvements made by nations, their friendly or unfriendly dispositions towards others, and the consequences thereof, are the facts which the Political observer deals with, which he generalizes, upon which he founds his conclusions.

Q.—What advantages have Mathematical and Experimental Science over Moral and Political Science in respect of the evidence upon which they severally rest?

A.—The advantages which Mathematical and Experimental Science have over Moral and Political, are indeed striking to every reader. The Mathematical Science seems to him to have the greatest advantages on its side. It deals with abstract quantities, and therefore with such niceness of reasons as are not to be shaken, as are not to be doubted by the greatest sophists, as are to continue the same for ever. Experimental Science has similar advantages. It has the opportunity of bringing the facts to the test, by reproducing them under the conditional circumstances. It has nothing to doubt of the truth or the falsity of its facts. It is the Politician and the Moralist that labor under the greatest disadvantages; neither the Political Observer nor the Moralist can ascertain the reality of their facts but after long observation and several trials. It is men that they deal with, whose constant fickleness and liability to changes compels them to be extremely cautious. It is this that causes them to suspect the results which they wish to accomplish, even after they have well ascertained their facts.

Q.—What is the doctrine of the "original contract?"

A.—By the doctrine of the "original contract," called by some writers the "social compact," from its peculiar nature, we mean that certain agreements have been made or entered into between the people and the chosen rulers of the State. It declared that the will of the majority should bind the minority. It alleged the duty of obedience on the part of the subjects, and of lawful government on the part of the rulers. It made resistance justifiable when the sovereign violated the terms of the contract.

Q.—To what form of Government has India been generally subject?

A.—The Indians have been generally subject to the worst form of Government, they have been the thralls of despotism, they have scarcely been blessed with the dawn of freedom, so essential to man as

a moral being. Now that they have been blessed at least with a free Government, and enjoy and reap its fruits, they shudder to look on their former days.

Q.—What is the form of Government in Turkey? Mention the principal officers engaged in it, with the functions of each?

A.—The Government of Turkey is entirely absolute. Both the legislative and the executive powers are lodged in the King. In him is concentrated the whole military power. In him resides the power of naming officers. He is the fountain of honor and the source of all power. He is in fact the State. All the principal dignitaries of the State are named by him, so that almost nothing is left to resist his all-mighty and overbearing authority. The principal officers are the Grand Vizier, the Sair-ul-Sadir, the Reis-effendi, the Capitan, the Mullah, the Cazi, the Mufti, and several others. All these are appointed by the sovereign. The Grand Vizier, called the "Supporter or Pillar of the State," is the Prime Minister. The Reis-effendi is the Minister of foreign affairs. The Mullah is the chief Judge, the Cazi is somewhat like the Puisne Judge, the Mufti is the chief Lawyer, and so on.

Q.—On what do you found the necessity for taxation by Government?

A.—No Government can possibly exist without levying taxes on its subjects, either directly or indirectly. It is tax that supports a government. It is tax by which the necessary expenses of a government are defrayed. If self-preservation and self-defence be virtue, every Government has a right to tax, but that tax should not be overmuch, it should not exceed the means of its subjects. Since every government is therefore under the necessity of imposing taxes, not to lay a tax is not only not good, but it is a very great evil, and an example of this is found in Turkey.

Q.—By whom are laws at present framed in India, and what is the mode of procedure?

A.—The wholesome laws under which the present Indians find themselves blessed and happy, are framed by the Governor General in Council; but they are subject to revisal, and may be either passed into laws or rejected.

Q.—What theory was started by the Tory party on occasion of the attempts of James II[d] on the Protestant Religion?

A.—The theory of "Divine Right and Passive obedience" was started by the Tory party when James II[d] made an attempt on the Protestant Religion.

Essay by Gobind Chunder Sandel, Senior Class, Benares College.

On the difficulty of providing employment for youths educated in Government Colleges.

Of the thousands who are educated in the Colleges of India, how many are there that fill any post of trust or honour under Government? In the Lower Provinces, very few; in the North Western Provinces, comparatively speaking, none. The Collegiate education of these youths, instead of forwarding their interests, serves only to hinder their worldly career. The young Lalla, who leaves his muktub with no better knowledge of the Persian than could be called from the first two or three chapters of the Gulistan, is much better off in this respect than the lad who consumes the best years of his life in an English seminary. That the evil here alluded to, does really exist, no one will deny who has turned his attention to things as they stand at present. But whence originates the evil? Assuredly with the boys themselves, is the answer that has generally been received; their want of a practical education and their ignorance of the Court language have been prominently brought forward, as the chief obstacles of their obtaining employment. That these youths acquire more or less of the vernacular as a prescribed course of their study, will be admitted by all upon a bare inspection, but how can their education be any wise practical, in the sense in which the word is generally taken, it is difficult to conceive. The system of instruction under which they are brought up, no way tends to make it so. They may be well grounded in the different branches of the sciences, they may be acquainted to some extent with the Literature of England, but they can never be expected to bring with them at their first entrance into the world, a capacity for official business, without a fair trial of some length. Whilst it is the express wish of Government to have the students of the Colleges only liberally educated, it is vain to hope that matters should be otherwise. But where is the necessity of Government's lavishing thousands of rupees annually on Colleges and Schools, when it does not mean to turn into some account the alumni who are brought up in its Institutions? how can its grand object of diffusing learning and civilization in the great mass of the Indian population, through the instrumentality of Colleges, be accomplished, when the youths who receive their education in them are debarred from every post of trust and honour. A love of knowledge for its own sake is a very weak stimulant for this purpose, some more substantial inducements are necessary. The philosopher, who builds up his educational system upon the pure love of knowledge, is as chimerical in his project, as the statesman who founds his legislation upon the pure love of virtue. If in most of the countries in Europe, the possession of general knowledge is made a condition to the obtaining of honourable employments, why is this anomaly suffered to linger in India? The youth who is edu-

cated in the Indian College, instead of finding his interests furthered by his stay in it, sees himself by so many years behind his brethren to begin life. Hence it is, that the greatest number of the boys leave the school before they have completed the prescribed course of study, and as soon as they think themselves in a position to understand the commonest letters in English, and able to copy them out. Those boys who are tempted to stay somewhat longer than the others, are made smartly to feel their folly when they enter life. They find themselves reduced to the necessity of courting the favor of the very Lallas and Kiranees whom they are inwardly disposed to look down with contempt for their ignorance. I do not advocate that these youths should attain *per saltum* the highest posts available to the natives of this country, such a measure would undoubtedly be unwise, but let them be placed in the way to them. Let their general knowledge be made a ground of preference, *ceteris paribus;* and let it also counterbalance such of their deficiencies as can be supplied by a few months' official experience. We will not deny that the heads of the Indian Government have from time to time endeavoured to remove the evil here complained of, but their efforts have been useless. Lord Hardinge's resolution of 1842 remains up to this day a dead letter. Of the numerous respectable offices which the liberality of the British Government has thrown open to the inhabitants of this country, almost all of them are as yet the fruit of the forbidden tree to the youths who are educated in the Government Colleges.

Questions in Taylor's History of India, proposed to the Senior Class, Bareilly College, and Answers by Rampershad.

Question.—Give an account of the ancient intercourse between Europe and India, including the expedition of Alexander the Great, and trace the routes of commerce, and the progress of discovery at the time of the foundation of the Portuguese empire in India?

Answer.—In ancient times, Indian Coasts and the Island of Ceylon had been frequently visited by the Greeks and the Romans, who used to come to take from India and Ceylon articles of luxury to their country. Till the time of Alexander, there was but very little intercourse between India and Europe, that conqueror had come to India by a road lying through narrow defiles; when he had come as far as the Punjab, he was opposed by Porus, a powerful monarch of that part of India. After many severe engagements, Porus was defeated, and his armies fled. He then submitted to Alexander, and agreed to pay him tribute. Alexander resolved to march further into India, but his soldiers complained of the fatigue, and the troubles they had undergone in their journey, and with one voice refused to march any further. He therefore returned to his co

with a part of his army, leaving the rest under the commard of Nearchus, whom he ordered to bring that part of his army by water. The Venetians and the Phœnicians who were the masters of the Indian trade used to come to India by the routes through Alexandria and Suez. From Venice the ships were sent to Alexandria, and thence through the Red Sea or the Indian Ocean they were brought to the mouth of the Indus, and whence their commodities were distributed to all the parts of India. The Phœnicians used to come by Suez, and thence took the same route as the Venetians. Many attempts were made to discover a new road to India, but all failed, at length Vasco Degama discovered the road round thè Cape of Good Hope, and laid the foundation of the Portuguese empire in India.

Q.—Describe briefly the proceedings of the Portuguese in India till the decline of their power, and the rise of the Dutch and English East India Companies?

A.—The Portuguese, after taking possession of Cochin, cast their eyes on other provinces, they were not yet so powerful as to go and conquer whatever they desired ; they assisted Buhader Shah, who was in rebellion against his brother, and thereby obtained Din as a reward for their services. Having taken Surat and Goa, they began to think themselves as the Emperors of India, and formed designs for further conquests. They had been successful in their attempts, had they treated their subjects and their dependent chiefs with justice. When the Dutch and the English appeared on the coasts, the natives formed an alliance with them to expel the Portuguese from India. They readily accepted their alliance, and in the course of time succeeded in expelling the Portuguese from India, and depriving them of their possessions.

Q.—Name the Mahomedan dynasties which successively ruled in India, giving the dates of the succession, and a short account of the founders of each ; and name the emperors of the present house in order from the time of Baber, assigning the date of their accession to the throne respectively ?

A.—The Mahomedan dynasties are 1st. *Ghuznavee*, which was founded by Mahmud, who invaded India at twelve different times, and carried away much valuable spoil. 2nd. Ghori, which was founded by Kootuboodeen. 3rd. Khiljie, founded by Ala-oodeen, whose general Muluch Cafur invaded Dekan, and carried away great riches. In his time, a great number of Moghuls who had invaded India on former occasions were massacred. 4th. (Tughluck) founded by Mahomed, who had been the Governer of Lahore. 5th. Syud, founded by Khizir. th. Lodi, founded by Behlole, an Afghan. 7th. Moghul, founded Baber, who invaded India, and conquered it. 8th. 2nd Afghan, led by Sheir Shah, who defeated Humayoon, and expelled him

from India. The names of the emperors of the Moghul dynasty are, Humayoon, Akber, Jahangeer, Shah Jehan, Aurungzebe, Buhader Shah, Jehandar Shah, Ferokh Seir, two Syuds, Mohumed Shah, Ahmed Shah, Alumgeer the 2nd, Aligaher, Shah Alum, Akber Shah, and Buhadur Shah who is the present emperor.

Q.—Give an account of the capture of Calcutta by Suraj-ood-dowla, and its recovery by the English?

A.—Suraj-ood-dowla was informed that the factory at Calcutta contained great riches; pretending that Calcutta was badly governed, he led his army against it, and captured it, as there was no opposition made to him; many English escaped in boats down the river, but 147 were taken prisoners, and confined in a chamber of 18 square feet for the night, the next morning only 23 were found a ive.

Q.—What are the circumstances which led to the battle of Plassey, to the supercession of Mir Jaffer by Mir Casim?

A.—The capture of Calcutta and the treatment of the English by Suraj-ood-dowla led to the battle of Plassey. Mir Jaffer's inability to govern, his treating the subjects with cruelty, and his breaking off the treaty made by him with the English, led to the accession of Mir Casim.

Q.—Mention the principal events which occurred during t he administration of Warren Hastings?

A.—The principal events which happened in the administration of Warren Hastings are these. The war with the Rohillas, the treatment (of Raja Chet Singh of Benares) of the Begums, and the hanging of Nund Comar.

Q.—Explain the causes, and relate the vicissitudes of the second war with Hyder?

A.—The causes of the 2nd war with Hyder are these. The English had entered into offensive and defensive alliance with the Mahrattas. When they invaded Hyder's dominion, they called on their English allies to assist them, and the English, according to the treaties, were obliged to assist them, and this involved them in a second war with Hyder, the result was, that after many engagements Hyder's troops were defeated, and he died; and a part of his dominion was annexed to the British and Mahratta territories.

Q.—What territorial acquisitions and political advantages gained by the British during the administration of the Marquis lesley.

A.—The territory of Mysore was annexed to the British dominions, and the administration of Surat and Tanjore was taken by the British into their own hands.

Q.—What were the circumstances in which the war with the Goorkhas originated and the incidents of it, and how was it terminated?

A.—The frequent encroachments of the Goorkhas and their aggressions led to this war. In this war, the English greatly suffered from the barrenness and ruggedness of the country, from the valour of the Goorkha's, and partly from the inexperience of the officers. When the English invaded Nepal from various sides the Goorkhas were defeated, and were obliged to purchase peace by the sacrifice of a large part of their dominions, and by giving the expense of the war to the English.

Q.—Give an account of the career of Trinsbuckjie Danglia, and of the treaties made with Bajee Rao, the Guicowar, and Scindia in 1817.

A.—After the defeat of the Peshwa, Trinsbuckjie Danglia was taken prisoner and confined in the fort of Tana, whence he escaped and fled to Poonah, there collecting his followers he fought with the British, but was defeated, and leaving his followers fled and took shelter in the Mohades Hills. The treaties made with Bajee Rao, Guicowar and Scindia were nearly the same, they were all required to pay the expenses caused by the preparations for war, and to give up some portion of their dominions to the British, to dismiss all the French or Americans who were in their services, not to allow any European to remain in their dominions without the consent of the British, and to pay the British Detachments kept in their dominions.

(D.)—INDIGENOUS SCHOOLS AT AJMERE AND ROORKEE.

Indigenous Schools in Ajmere.

Dr. C. Buch reports, "The Pergunnah Visitor, Jugul Kishore, having joined his appointment on the 1st of September 1851, he was directed to commence his labours by ascertaining the state of the Indigenous Schools in the town of Ajmere. During the cold season, he was employed in visiting the province of Ajmere, with the exception of the pergunnah of Mussoodah. In conformity with his instructions, he visited every considerable village, and made inquiries respecting the state of education in the district. In several localities he seems to have had considerable difficulty in obtaining accurate information.

"It had been intended to employ a second Pergunnah Visitor in the pergunnah of Mussoodah, and the province of Mairwara. A pupil of the Benares College applied for the appointment, and some correspondence took place on the subject, but after a considerable delay it became necessary to dismiss his application, as the candidate insisted upon promotion being provided him within a specified time. The appointment is still vacant, but the Superintendent expects that he will soon be able to recommend." The Schools in the town of Ajmere were found to be 38 in number, and to contain 546 scholars, out of whom 254 were Mussulmans.

Persian and Arabic Schools,	15
Arabic ditto,	6
Hindee and Sanscrit ditto,	17
Total,	38

With regard to the Schools in the province, Dr. Buch writes, "in eight pergunnahs, viz., Ramsur, Kekree, Bhinai, Rajgurh, Pesaugun, Pohkur, Sawar and Ajmere, (exclusive of the town) which together cover an area of 1688 square miles, the Visitor found only 39 schools, or one school for every 43·28 square miles. Hence it appears that the mass of the people are most inefficiently provided with the means of education. This becomes still more evident when the 13 schools which exist in the town of Pohkur are deducted from the total number of schools in the above pergunnahs. In that case there remains only one school for every 65 square miles. And as the total number of scholars in the said 39 schools amounts to 510, it follows that there are a fraction more than 13 scholars for every 43·28 square miles, or one scholar for every 3·33 square miles. And if the Pohkur schools be omitted, there will be *one* scholar for every 5·1 square miles."

It is trusted that more important measures will have to be reported next year.

REPORT ON THE VILLAGE SCHOOLS OF THE SUHARUNPORE DISTRICT, (TUHSEELDAREES OF ROORKEE, DEOBUND AND SUHARUNPORE), FOR THE YEAR 1851, TO 1st MARCH 1852.

By Lieut. R. Maclagan, late Principal of Roorkee College.

The operations connected with the inspection of schools in the above District have, during the past year, been chiefly confined to the registration of the existing schools and collection of facts relating to the present state of Indigenous instruction; and the establishment of two Government Schools in the Tuhseeldarees of Roorkee and Deobund.

2nd. On the extension to this district of the scheme for village School inspection, a Native Visitor was sanctioned for the Roorkee Tuhseeldaree only. The first appointment took effect on the 19th August 1850; but this Visitor's bad health induced him to relinquish the charge on the 31st October following. Soon after, the appointment of three Pergunnah Visitors was authorized, for the Tuhseeldarees of Roorkee, Deobund and Suharunpore, the inspection of the fourth and most distant Tuhseeldaree of Nookur not being undertaken at present. It was arranged that one of these three should be subsequently advanced to the grade of Zillah Visitor. On the 21st December, the first of these three new Visitors commenced work in the Tuhseeldaree of Roorkee; the first Deobund Pergunnah Visitor entered on his duties on 6th January 1851; and the first in the Suharunpore Tuhseeldaree on the 16th June 1851. On 1st October, the Senior was promoted from the Roorkee Pergunnah Visitorship to the office of Zillah Visitor, and another Pergunnah Visitor, (a student of the 3rd Department of the Roorkee College, Senior Division) appointed in his place.

The following are the names of these Visitors, with their respective charges, salaries, &c.

Names.	*Appointments.*	*Salary.*	*Joined.*	*Left.*
Shumsooddeen,..	Pergh. Visitor Roorkee.	40	19th Augt. 1850,	31st Octr. 1850.
Kadir Ali,.....	Ditto ditto ditto, ..	40	21st Decr. 1850,	1st Octr. 1851.
	Zillah Visitor, ...	75	1st Octr. 1851.	
Mohummud Ali,	Pergh. Visitor Deobund	0	6th Jany. 1851.	
Mohee-oo-deen, .	Ditto do. Suharunpoor.	30	16th June 1851.	
Mohun Lal,.....	Ditto ditto Roorkee,.	30	1st Octr. 1851.	

3rd. The appointment of three Tuhseeldaree Schoolmasters having also been authorized, one was appointed to start the Roorkee School in September 1851; and in the following month, another long established as a Persian Teacher in Deobund, to the Tuhseelee school in that place. None has yet been nominated to Suharunpore; but a Schoolmaster of Jowalahpore, who is a candidate for the situation, and

who has for some time been studying to qualify himself, I have recommended for the appointment as soon as arrangements can be made for supplying his present place.

The following are the names of the Tuhseeldaree Schoolmasters, with dates of appointment, &c.

School.	Names of Schoolmasters.	Salary.	Date of joining.	Remarks.
Roorkee, ...	Hoossin Ali, ...	10 with fees.	19th Sep. 1851.	Salary 20, sanctioned.
Deobund, ...	Mehtab Ali, ...	Ditto, ...	11th Oct. 1851.	Ditto ditto.
Suharunpore,	.. .. ..	Ditto, ...	.. .. ..	Ditto ditto.

4th. The few observations to be made will be best introduced by the following Tabular Statement which exhibits the result of the investigations of the Native Visitors.

	Names of Pergunnahs.	Total Mouzahs.	Number of inhabited villages.	Number of these villages visited.	Of the villages visited, Number in which Schools were found.	Total number of the Schools.	Number of children receiving instruction in these Schools.	Population. Total.	Population. Boys.
Tuhseeldaree — Roorkee.	Roorkee, ...	161	143	143	28	39	281	54854	11992
	Munglour, ..	112	84	84	10	26	277	27846	5102
	Jourasee, ...	142	91	86	14	19	107	30596	6811
	Jowalahpore, ..	87	63	57	5	17	277	23958	5264
		505	381	370	57	101	942	137254	29169
Tuhseeldaree — Deobund.	Deobund, ...	173	173	173	13	13	443	51072 (62075)	20988 (23574)
	Ditto City, .	1	1	1	1	19		11633	2586
	Rampoor, ...	107	107	107	9	14	137	34442	7900
	Hatha, ...	35	35	35	1	1	2	15251	3588
		316	316	316	24	47	582	112398	35062
Tuhseeldaree — Suharunpore.	Suharunpore, .	206	168	168	9	9	642	57158 (91452)	11910 (13910)
	Ditto City, ..	1	1	1	1	44		34294	7000*
	Moozufferabad,	118	86	86	14	19	124	31852	6728
	Behut, ...	91	78	78	4	7	62	27896	6048
	Fyzabad, ...	79	67	67	4	7	53	20032	4247
		495	400	400	32	86	881	171232	35933
	Total...	1316	1097	1086	113	234	2405	420884	100464

* Estimate.

The numbers in the last two columns
the Manuscript Census returns furnished to me by the Collector of Saharunpore.

5th. It will be observed, that in the whole of this portion of country (making allowance for eleven villages not yet visited), the average percentage of boys under instruction is 2·41, the proportion of the whole population being 0·572 per cent. Of the three tuhseeldarees, Roorke has the largest proportion of schools, and of children receiving instruction, its percentage being 3·29 of the boy population. The most extensively instructed portion is the pergunnah of Suharunpore, including the city, which shows a percentage of 3·39 of the boys at school. The lowest in the scale is the pergunnah of Katha, in the whole of which was found only one school, attended by two boys, giving a proportion of the boy population of 0·055 per cent. The average number of scholars in each school appears to be between 10 and 11.

6th. There are no female schools; a few girls of Mussalman families, it was ascertained, are taught in their own houses to read the Koran.

7th. The 232 original schools are thus divided into the two main classes. The table shows also the proportion of the children attending each description of school, and adds the two tuhseeldaree schools.

	Pergunnahs.	Persian and Arabic.		Hindee and Sanscrit.		Tuhseeldaree.	
		Number of Schools.	Number of Scholars.	Number of Schools.	Number of Scholars.	Number of Schools.	Number of Scholars.
Tuhseeldarees Roorkee.	Roorkee,	22	125	16	120	1	36
	Munglour,	17	197	9	80	0	0
	Jourasee,	14	85	5	22	0	0
	Jowalapoor	7	59	10	218	0	0
		60	466	40	440	0	0
Tuhseeldarees Deobund.	Deobund,	19	261	12	150	1	32
	Rampoor,	10	118	4	19	0	0
	Katha,	1	2	0	0	0	0
		30	381	16	169	0	0
Tuhseeldarees Suharunpor.	Suharunpoor,	45	486	8	156	0	0
	Moozufferabad,	10	61	9	63	0	0
	Behut,	4	36	3	26	0	0
	Fyzabad,	6	48	1	5	0	0
		65	631	21	250	0	0
		15	1478	77	859	2	68